

WILD FLOWERS AS THEY GROW

Photographed in Colour direct from Nature



BY H. ESSENHIGH CORKE, M.A.

With descriptive text by

G. CLARKE NUTTALL, Esq.

25





Digitized by the Internet Archive
in 2025

https://archive.org/details/bwb_KU-692-214

Wild Flowers as They Grow

Volume VII

By the same Author

Trees and How they Grow.

With
15 Lumière Plates by H.
ESSENHIGH CORKE and 136
Photographs by G. CLARKE
NUTTALL, B.Sc.

CASELL & CO., LTD.
London, New York, Toronto
and Melbourne.



GREEN HELLEBORE

Wild Flowers as They Grow

*Photographed in Colour
Direct from Nature by
H. Essenhigh-Corke*

F.R.P.S., F.R.H.S.

*With Descriptive Text by
G. Clarke Nuttall*

B.Sc.

Seventh Series

*CASSELL AND COMPANY, LTD
LONDON, NEW YORK, TORONTO AND MELBOURNE*

1914

ALL RIGHTS RESERVED

CONTENTS

	PAGE
BLACK NIGHTSHADE	177
BUCKBEAN	29
DOVE'S FOOT GERANIUM	89
FLY ORCHIS	55
FRAGRANT ORCHIS	47
GREATER KNAPWEED	191
GREEN HELLEBORE	1
HAIRY VIOLET	96
MEADOW SAXIFRAGE	111
MEADOW VETCHLING	117
OX-TONGUE	185
PASQUE FLOWER	11
RED CAMPION	71
SEA HOLLY	124
SHEPHERD'S PURSE	38
SKULLCAP	162
TANSY	169

Contents

	PAGE
THISTLE, CARLINE	155
THISTLE, SPEAR-PLUME	147
WATERCRESS	80
WILD CHERRY	19
WOOD LOOSESTRIFE	141
WOOD SANICLE	64
YELLOW CHAMOMILE	132
YELLOW WORT	105

LIST OF PLATES

GREEN HELLEBORE	<i>Frontispiece</i>
	FACING PAGE
PASQUE FLOWER	12
WILD CHERRY	20
BUCKBEAN	30
SHEPHERD'S PURSE	38
FRAGRANT ORCHIS	48
FLY ORCHIS	56
WOOD SANICLE	64
RED CAMPION	72
WATERCRESS	80
DOVE'S FOOT GERANIUM	90
HAIRY VIOLET	96
YELLOW WORT	106
MEADOW SAXIFRAGE	112
MEADOW VETCHLING	118
SEA HOLLY	124
YELLOW CHAMOMILE	132

List of Plates

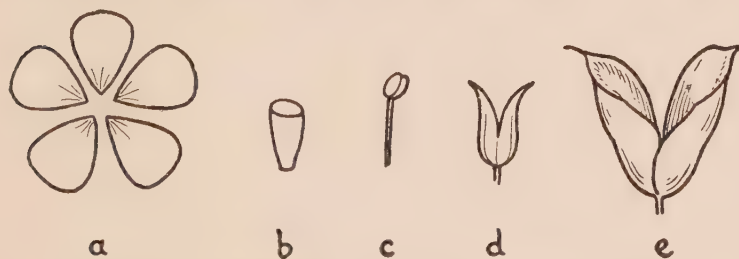
	FACING PAGE
WOOD LOOSESTRIFE	142
SPEAR-PLUME THISTLE	148
CARLINE THISTLE	156
SKULLCAP	162
TANSY	170
BLACK NIGHTSHADE	178
OX-TONGUE	186
GREATER Knapweed	192

WILD FLOWERS AS THEY GROW

THE GREEN HELLEBORE

HELLEBORUS VIRIDIS

THE Green Hellebore bears the largest green flowers that are known in our flora, but the distinction implied in that statement is a little



a, sepals. *b*, petal-nectaries. *c*, stamen. *d*, seed-case. *e*, fruit.

discounted by the fact that there are comparatively few green flowers known in our land. And these few are not common plants; no one, for instance, can accuse the Green Hellebore of familiarity as a wild plant, though it often finds a place in the

Wild Flowers as They Grow

gardens of those who can see beauty and charm outside the pale of mere colour. It is a plant that asks two conditions for its presence as a native: it wants the shade and moisture of a wood, a beech wood for choice, and that wood should be preferably on the chalk. Therefore it is chiefly found in woods in the south-east of England, since that is the region of chalk and beech wood, but it also grows with considerable frequency in the woods of Gloucestershire, since limestone crops up again about the Cotswolds.

The Green Hellebore is own brother to the beautiful Christmas Rose—

“ Know ye the flower that just now blows
In the middle of winter—the Christmas Rose.

Though it lacks perfume to regale the nose,
To the eyes right fair is the Christmas Rose—
A fiddlestick’s end for the frost and snows;
Sing hey, sing ho, for the Christmas Rose.”

(*Punch*, Dec. 30, 1882.)

—which was the Black Hellebore, or the “Sovereign Hellebore” of the old herbalists, who used it for

The Green Hellebore

many purposes, but particularly as an antidote to madness, and for the cure of melancholy—

“Borage and Hellebore fill two scenes;
Sovereign plants to purge the veins
Of melancholy, and clear the heart
Of those black fumes which make it smart:
To clear the brain of musty fogs,
Which dull our senses and soul clogs.
The best medicine that e’er God made
For this malady, if well assaid.”

said Burton in his “Anatomy of Melancholy.”

And the Green Hellebore shone in its relative’s reflected glory, and was also considered as “very good against all those diseases whereunto black Hellebore serveth.” It was commonly known as the “Bastard Hellebore,” and its leaves “dried in an oven, after the bread is drawne out, and the poulder thereof taken in a figge or rasin or strawed upon a piece of bread spread with honey and eaten” were a much-prescribed remedy for worms in children, therefore was it also known as “Veratrum.” But its use was not unattended with

Wild Flowers as They Grow

danger, for "where it killeth not the patient it would certainly kill the worms, but the worst of it is, it will sometimes doe both," frankly admitted one of those "ancient simplers" to whom men in faith entrusted their bodies in olden days.

As a veterinary medicine, too, it was of some repute, as Dodoens, the Dutch herbalist of the early sixteenth century, found out. "Thrust into the eares of oxen, sheepe, or other cattel helpeth the same agaynst the disease of the longes, for it draweth all the corruption and greefe of the longes into the eares." And in times of pestilence "if one put this roote into the bodyes of any it draweth to that part al the corruption and venomous infection of the body. Therefore assone as any strange or sodayne greefe taketh the cattell, the people of this Countrie do put it straight-waies into some part of a beast, whereas it may do least hurt, and within short space all the greefe will come to that place, and by that meanes the beast is saved."

The Green Hellebore is a perennial herb, and

The Green Hellebore

its green flowers appear in the very early spring, and hang in small groups of two, three, or four together from the top of the stalk. They are flowers of a particularly simple type, belonging to the buttercup family—the *Ranunculaceæ*, the ancestral type, indeed, from which most modern flowers in the ordinary sense are derived, albeit they have one striking peculiarity, their petals have all been transformed into tiny green tubes of honey. It is the sepals, that, keeping the green hue characteristic of sepals as a rule, enlarge and spread themselves out to look as though they were a corolla of green petals. The little petal honey-vessels are two-lobed, and lie almost hidden at the base of the sepals, there being eight to ten of them. Since the flowers hang face downwards no rain can enter the tubes to dilute the honey and minimise its sweetness. (It is a curious point to notice that this family of flowers is singularly inconstant in the matter of petals, which inconstancy seems often specially bound up with the produc-

Wild Flowers as They Grow

tion of honey. Sometimes the petals are simple and ordinary enough, witness the buttercup [Vol. III], and just carry their honey in tiny bags at their base, but sometimes they possess long spurs in which they keep their honey, as in the columbine; in the monkshood [see Vol. I.], the petals form two most curious stalked objects—nectaries again—that stand up stiffly, and are hidden under the hood. Then sometimes they seem to pass gradually into stamens, as in the mousetail, or at other times there are no petals at all, as is the case in the marsh marigold [see Vol. II.], and the wood anemone [see Vol. I.]. The whole study of petal metamorphosis and consequent sepal development in the *Ranunculaceæ* is therefore a particularly interesting one.)

There are a considerable number of small stamens which surround two or three quite distinct seed-cases, each of which terminates in a long beak—a style—which is held, when the flower opens, over the nectary. On the tip of this beak are many minute mounds or papillæ, and these papillæ

The Green Hellebore

continue along the underside of the style for some distance. Owing to the pendulous position of the flower, insects visiting and attempting to drink from the nectar vessels must clasp these styles and cling to them as they sip. Any pollen, therefore, on their bodies will be rubbed off by the papillæ, and it is worth noticing that the grains seem to wedge in exactly between the mounds, and thus to be held fast so that they will not fall off. As the Green Hellebore blossoms so very early in the spring, long before the bad wintry weather is past, visitors, and these are chiefly flies, are not very numerous. However, the flower remains in this first stage of its existence for about a week, then it enters upon the second stage. The styles wither and draw inwards, the stamens grow and open their anthers, this opening being accomplished in a definite and orderly fashion. First the outermost rings open, their anthers twisting themselves so that they are exactly over the adjacent petal honey-cup, just where the stigmas were before

Wild Flowers as They Grow

they withered, and an insect coming for the honey must needs brush on them. The next day these stamens, having performed their task, move farther out, so that the second ring can take their place over the honey-pots. On the third day these in turn give place to the third ring, and so on, until all the stamens have held their anthers over the honey, and discharged their pollen on to some honey-seeking insect. "The punctuality and exactitude with which the whole series of operations is carried out is most extraordinary," says Kerner.

When all these various operations are successfully accomplished the several seed-cases increase in size and ripen into "follicles," which are like great pockets or pouches that open by a slit at the top. They contain a number of small seeds which easily fall out. The leaves are, as a rule, not fully developed until the flowering time is over. They rise from the ground—"radicle leaves"—on long stalks, and are large and handsome, divided so deeply into a number of lobes that the divisions

The Green Hellebore

reach almost to the midrib. Hence one name of the plant is "Bear's Foot." Where the stem branches there are also single smaller leaves which have no stalk whatever, and are not so much divided as the others.

The Hellebores were first separated into a definite genus by the French botanist Tournefort in 1700, and Linnaeus set the seal of his approval on it in 1735. There are fifteen species of Hellebore known, but only two are natives of Great Britain—the Green Hellebore of our sketch, and the Fœtid or Stinking Hellebore or Setterwort (*H. fœtidus*). The latter is a rare plant, a foot or so high, whose clusters of drooping green flowers are tinged with purple. The sepals are more concave, and the flowers more globular than in the Green Hellebore. The leaves are evergreen, and in a thick bushy tuft. The plant has a disagreeable smell and taste, hence its primary name. The other name, "Setterwort," alludes to the fact that it also was used as a veterinary medicine.

Wild Flowers as They Grow

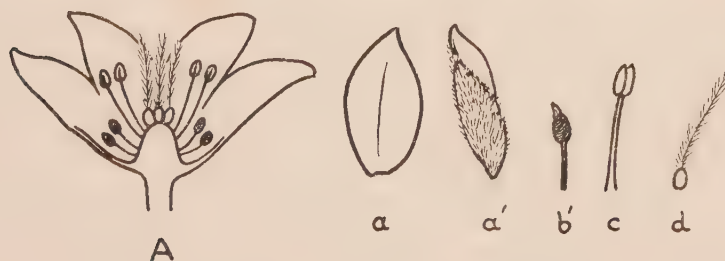
“ Husbandmen are used to make a hole and put a piece of the root into the dewlap of their catel, as a seton, in cases of diseased lungs ; and this is called pegging or setting,” says Gerard of this plant. (A seton is a thread of silk.)

Both Hellebores were sometimes called “ Peg-roots ” in certain parts of the country.

THE PASQUE FLOWER

ANEMONE PULSATILLA

ROUND the Pasque Flower there circles a curious tradition. The plant is said to have sprung from the blood of those Danes who were



A, section through flower. *a*, sepal (face). *a'*, sepal showing hairy back.
b, nectary. *c*, stamen. *d*, seed-case with feathery style.

slain in battle in the stormy early days of our nation's story. Hence an old name for it is "Danes' Blood." Two other plants are sometimes credited with the same origin and the same name, the purple clustered campanula (*Campanula glomerata*), and the white-splashed-with-purple dwarf elder or Danewort

Wild Flowers as They Grow

(*Sambucus ebulus*), and it is an interesting point that the legend lingers and all three plants grow together by the Bartlow Hills in Cambridgeshire, where there still may be seen the Danish earth-works thrown up to commemorate the victory of Canute the Dane over Edmund Ironside the Saxon.

As for the name "Pasque Flower": "They floure for the most part about Easter, which hath moved me to name it Pasque Flower or Easter flower," said Gerard, Easter being known as "Pask" in early English days. So, too, we have the French *pâques* for this same festival. It must be remembered that Easter was twelve days later in the season then, as the calendar had not been corrected when Gerard wrote. Really the plant flowers about the middle of April. This statement of Gerard's seems sufficient to account for the name, but a second explanation is sometimes put forth, namely, that the bright green dye that can be obtained from the plant was used in that wonderful staining of Easter eggs in which our forefathers



PASQUE FLOWER

The Pasque Flower

delighted. Were not four hundred common eggs turned by staining and gilding into "Pasch Eggs" one Easter alone for the royal household of Edward I.? But this explanation does not really hold water, for the plant is too rare in our country for it to have been of much general service in this matter. Indeed, the places where it can be found wild may be almost counted on one's fingers. Even the ever-to-be-remembered John Gerard only refers to it as growing in one spot in England, and in that reference confers immortality upon a certain Mr. Fuller, the parson of the village of Hildersham (Cambridgeshire), who had a close or pasture full of it, which he, being "a very kind and loving man, was willing to shew unto any man . . . who desired the same." Other spots where it is truly wild are known to botanists to-day, but they are chary of imparting their knowledge to society in general. Suffice it to say that the plant is a definite chalk lover, and does not wander far from chalky pastures, in this land at any rate.

Wild Flowers as They Grow

It is a perennial herb, with a stout woody root-stock that runs deep into the earth to enable it to secure moisture in the dry calcareous soil. Year by year it throws up on long stalks a quantity of pretty leaves, which are cut into a number of narrow segments after the fashion of a carrot leaf. When young they carry a coat of silken hairs, as do also the flower stalks and buds. As a bud opens a large and very striking flower is revealed—a vision of dark purple and bright yellow. The dark purple is a ring of six petal-like sepals, each richly coloured on the inside, but paler and shining with a silky coat on the back. The bright yellow is a circle of many stamens. There are no petals, but between the true stamens and the purple sepals, low down, almost hidden, are a number of peculiar transformed stamens which are now nectaries, and bait the flower with honey. In the centre of the flower is a mass of purplish green structures—seed-cases topped with a dainty feather in lieu of the usual green column. Obviously it is a flower of the

The Pasque Flower

Ranunculaceæ type, the brother of the green hellebore, the clematis, the buttercup (Vol. III.), the marsh marigold (Vol. II.), and, strangely enough, of the monkshood (Vol. I.) and the larkspur.

During its three or four days of life there is quite a sequence of small happenings. At the outset the flower-stalk is short, the flower is held up cup-wise, the violet sepals glow richly, its honey bait is prepared, and the feathery stigmas are on the alert ready for fertilisation. Bees and some other insects are attracted to it, bringing with them pollen from a day or two older flower and carrying off honey. At nightfall the flower closes, to reopen in the morning's sunshine. But the flower stalk has not ceased to grow, and within forty-eight hours the blossom droops a little on the lengthening stalk; the stamens, too, are maturing and beginning to discharge their pollen, while the sepals, longer now, curve protectingly round the opening anthers. When the flower

Wild Flowers as They Grow

closes next at nightfall the purple surface of the sepals gets smeared a little with pollen. And still the flower-stalk goes on growing, until it is ten or more times as long as it was at first, and now the flower droops in earnest—a regular bell. The sepals, double the size they were, begin to turn back—convex, not concave now—and the pollen on their surface is bound to touch the feathery stigmas. So there is an inevitable self-fertilisation, if by chance a probable cross fertilisation fail.

But the withering of the flowers is not the departure of beauty, for, though the sepal dress falls off, the delicate plumes of the seed-cases grow until they are more than an inch in length, and the massed fruits become a beautiful tuft of waving silvery feathers upon a core of seed-cases, filled each by a single seed. As the core dries its parts separate and, wafted by the wind, the feathery plumes carry afield their individual burden of a potential new plant—the little “achene.” To

The Pasque Flower

catch the wind more effectually the still enterprising flower-stalk even continues to grow after the fading of the flower.

Now on every flower-stalk, otherwise quite bare, is a single curious circle of narrow leaflets. At first this wrapped up the bud, but when the bud opens it stands just below it; later, as the stalk lengthens, it gets farther and farther from the blossom and it is far down the stalk when the feathery fruits mature. If one trace back the many leaflets one finds that they are joined at their base into three parts; really they are just three much-dissected and stalkless leaves, and the presence of this leafy circle on the bare flower-stalk is one of the most characteristic marks of the *Anemone* genus. It has already been referred to in describing our only other native *Anemone*—the White Wood *Anemone* (*A. nemorosa*) (see Vol. I.).

Several other English countryside names are recorded for this plant; “Bluemony” is obviously a corruption of “Blue *Anemone*,” “Cov-

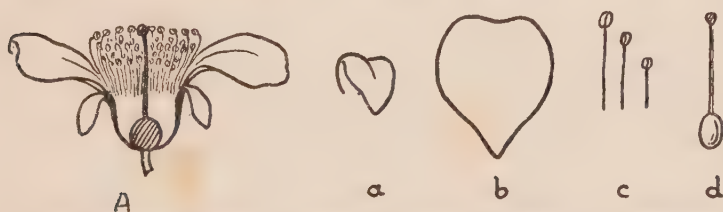
Wild Flowers as They Grow

entry Bells" is an Elizabethan name, "Flaw Flower," from *flaw*, a gust of wind, is an Anglicised version of Anemone, which in its Greek original signifies "wind." "Passe-flower," being Pasque Flower euphonised, "may passe currant without any further descant on the name," as Parkinson says. As to any possible "virtues" in the old herbalists' sense it appears, strange to say, to have none, in spite of their admission that "Passe-floure doth extremely bite and exulcerateth and eateth into the skinne if it be stamped and applied to any part of the body." To them, as now to us, Pasque Flowers "serve onely for the adorning of gardens and garlands, being floures of great beautie."

THE WILD CHERRY

PRUNUS AVIUM

“THE English Cherry tree groweth to an high and great tree, the body whereof is of a mean bignesse ; which is parted above into many boughes, with a barke somewhat smooth,



A, section through flower. a, sepal. b, petal. c, stamens. d, seed-case, style, stigma.

of a brown crimson colour, tough and pliable.” One cannot better Gerard’s description. High, indeed, it is when in the open and with space around in which to develop, for seventy feet is then no very rare measure of its stature. The trunk towers like a slim pillar scored by character-

Wild Flowers as They Grow

istic transverse fissures—lenticels, or breathing spaces—and the “very many boughs” into which it ultimately divides can be seen in days of winter leaflessness to ascend sharply.

It is in the earlier days of the year that the Cherry tree is in its glory, for then

“ Like drifts of tardy snow
On leafless branches caught
The cherry-blossoms blow
That May has brought.”

(MARGARET DELAND.)

though “May” is rather a poet’s concession to rhythm than the truth, for April is really the Cherry tree’s month. The white blossoms, all fragility and delicacy, appear massed on the branches in great clusters, but the clusters are, in reality, built up of many small groups of three, four, or perhaps five, individual flowers, which hang on long stalks from a base of brownish-green bracts. Each group is the contents of a single bud which was formed during the preceding year, rested all the winter, and sprang



WILD CHERRY

The Wild Cherry

into activity in the early spring days, and the bracts are the wrappings that kept that bud warm and dry during the damp of autumn and the cold of winter. No leaves are unpacked from these flower-buds, nothing but the white drooping blossoms.

And each Cherry flower is a thing of beauty—a beauty of perfect symmetry without formality which carries a gleaming silveriness, a faint fragrance and an abundant sweetness. The sepals, petals, and stamens are set round the brim of a little cup which is hollowed out of the end of the stalk. The five sepals, long and pointed, are bent sharply back, and form a five-lobed tunic round the cup; the five petals are poised most delicately as a bell round the margin, so delicately, indeed, that almost before the flower's day is over they fall like snow. The many stamens, perhaps thirty to forty, stand in a thick ring on the inside of the wall of the cup, just below its margin, and they are of varied lengths, the outermost the longest. Looking down

Wild Flowers as They Grow

upon the flower their heads appear roughly to form an inverted cone, so that any insect plunging into it must needs coat head, body, legs and all with pollen dust. The little anthers open by long slits, those of the shortest stamens first, and they apparently turn themselves inside out to divest themselves of the pollen they have produced, which, however, clings to them like a golden coat.

On the floor of the cup stands centrally a rounded, elongated seed-case, containing two ovules in its single chamber. As the yellowish, nectar-oozing walls of the cup bulge outwards a little, the seed-case has round it a clear space bounded by alluring, shining sweetness. From the top of the seed-case a column—or style—tapers upwards until it is as tall as the tallest stamens and its rounded dark-brown knob-head is on a level with the topmost anthers.

So dainty and attractive a blossom does not lack insect visitors, though their number is, to some extent, limited by the earliness of the season,

The Wild Cherry

and, any way, as each flower lasts seven or eight days, there is plenty of opportunity for fertilisation from a neighbour. As the anthers in no way approach the stigma it is not possible for a flower to fertilise itself without outside aid. Honey-sucking insects moving in the hollow space about the seed-case touch the stigma with one side of their heads and bodies, and the stamens with the other, so there is no transference of pollen from stamens to stigma, and probably small pollen-eating flies rummaging among the anthers may bring about occasional self-fertilisation.

The petals drop, the cup-like receptacle even withers and falls, and the seed-case that stood within is left naked to develop into the familiar "cherry." The outer wall of the ovary becomes dark and succulent, the inner wall stony-hard, and one ovule is transformed into the kernel; the other usually aborts. The fruit ripens in mid-summer; there is a German tradition that the cuckoo does not cease his song until he has had

Wild Flowers as They Grow

three good meals of cherries. Gerard had a bad opinion of cherries on the whole, and "those little sweet ones which be wild and soonest ripe be the worst; they contain bad juyce . . . and doe ingender bad blood . . . therefore in well-governed commonwealths it is carefully provided that they should not be sold in the markets in the plague time," he tells us.

The leaves are only beginning to come when the flowers are shedding their petal snow. In the bud they are folded each in halves along the midrib, and even after the buds have burst and they have grown larger and their stalks have lengthened, their blades still remain closed like a book, a delicate varnish keeping the two surfaces attached. Ultimately, when quite of good size, they open, and show a shining surface in which delicate greens and browns merge, and which is traversed by parallel veins running closely, side by side, from midrib to margin. Along the branches the leaves arise singly and in a spiral, but out of

The Wild Cherry

the big terminal bud of a twig ten or a dozen leaves emerge in various stages, some still folded and almost translucent, others older, firmer, their margins beginning to gape apart, and yet others that have quite opened out, the whole being a charming study in bud development. One striking feature marks their long stalks. Just a little below the blade are a couple of reddish nodules, the purpose of which is by no means obvious. They are popularly supposed to be "extra floral nectaries," i.e. nectaries placed outside the flowers to divert the attention of small flies and other unprofitable insect visitors. But another, and perhaps more tenable, theory is that they are disks for the special absorption of moisture as it trickles off the blade down the stem. The two little stipules, which at the beginning of things are at the base of each leaf stalk, soon dry and fall. As autumn comes the greens and browns of the leaves are exchanged for rich crimsons, and the tree that puts on a snow-white flower-garment

Wild Flowers as They Grow

for its awakening dons a flaming, ruddy robe ere it passes to rest. No leaves of our countryside can vie with those of the Cherry in their autumn brilliance.

The bark of the Cheery tree is particularly characteristic, rough on the lower part of the trunk it is smooth above, of a peculiar reddish hue, and scored by transverse markings, as already said. It peels off in thin strips. Through the bark gum oozes. "The gumme of the Mazar is good to be dronken in wine," said one of the old herbalists, and there are legends afloat that its nutritive qualities are so great that once it alone kept more than a hundred men alive for nearly two months during a siege! The wood is tough and close-grained, and very valuable for furniture making, while Cherry-wood walking sticks are everywhere appreciated for their toughness, durability, and a certain fragrance that they possess.

A section of the Wild Cherry trees of Great Britain are sometimes placed in a separate sub-

The Wild Cherry

group under the name of *Prunus Cerasus*. These individuals are shrubs rather than trees, they give off many root-suckers which *Prunus avium*, pure and simple, does not, and their fruit is sour instead of being sweet, but apparently these distinctions are not altogether constant, hence the difficulty in considering *P. Cerasus* to be a separate species from *P. avium*.

All sorts of curious names have been applied to the fruit and hence back to the tree as the parent. Such names, for instance, as "Mazars" or "Mazards" (from the Latin *manza*—a wild cherry); "Merries" (from the French *merisier*, which is itself derived from *amère*, bitter, and *cerise*, a cherry); "Gaskins" and "Gascoignes." The last two terms probably come from the French *guignes*, which appears to have for its origin a Turkish name of the tree. "Gean Tree," or "Jean Cherry," both common names at one time, must be referred to the same source. Other names are "Grund," "Carrons" and "Shir" (meanings unknown), and

Wild Flowers as They Grow

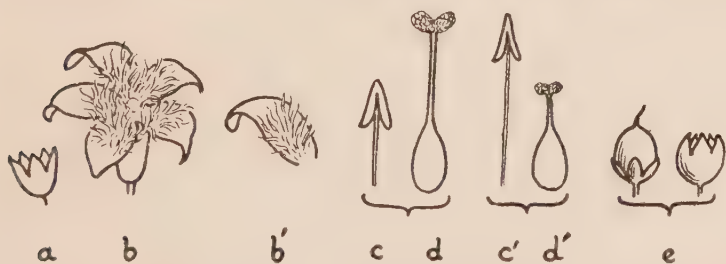
“Crab Cherry.” Since “Crab” comes from the Anglo-Saxon word *scrobb*, a shrub, “Crab Cherry” is especially a name for *Prunus Cerasus*.

The Cherry is certainly indigenous in this country, though cultivated forms were introduced by the Romans. These, however, disappeared, and the Cherry in cultivation was not re-introduced until the reign of Henry VII., when trees were brought from Flanders, and a Cherry orchard planted at Teynham. “Cherries on the ryse,” i.e. wild cherries on twigs, was one of the “Cries of London” in the fifteenth century.

THE BUCKBEAN

MENYANTHES TRIFOLIATA

BY common consent one of the very prettiest flowers of our land, the Buckbean, nevertheless, seems long in coming to its own with the



a, calyx. *b*, corolla. *b'*, petal. *c*, *short* stamen associated with *d*, seed-case, *long* style, stigma; or *c'*, *long* stamen associated with *d'*, seed-case, *short* style, stigma. *e*, fruit, closed and open.

generality of plant lovers. A century and a quarter ago, William Curtis, one of the keenest botanists of the day, lamented this very fact—"It is one of the most beautiful plants this country can boast," he says, "nor does it suffer when com-

Wild Flowers as They Grow

pared with the Kalmias, the Rhododendrons, and the Ericas of foreign climes, which are purchased at an extravagant price and kept up with much pains and expense, while this delicate native, which might be procured without any expense, and cultivated without any trouble, blossoms unseen, and wastes its sweetness on the desert air." Of course he refers to the little Alpine rhododendron; the big showy garden shrubs were not then common in gardens, but nevertheless his lamentations still hold generally good.

The Buckbean is one of the plants commonly overlooked. Perhaps the fact that it always stands with its feet in water, so to speak, its range limited to watery and marshy places, eschewing ordinary waterless gardens, is the chief reason for this lack of appreciation, but even where there is water it is more often than not absent.

It has a thick creeping rootstock that pushes its way through or over the soft wet ground, "like worms crawling over the soil," says Kerner, and below gives off a dense matwork of roots. Sir



BUCKBEAN

The Buckbean

William Hooker, travelling in Iceland, where the plant grows very plentifully, put on record the great service it was to travellers, for the leaves indicated, and its matted roots provided, a safe pathway over many a bog. Moreover they served as a convenient cushion material to put under the saddles to prevent chafing of the horses. Linnæus found another use for the roots in Lapland, for there the natives pulled them up and gave them to their cattle. Further, in that region of scarcity, he noticed that at times they served—when powdered, mixed with a little meal, and baked into loaves—as food for man. The bread was bitter and far from epicurean, but, from the starch it contained, fairly nutritious.

From this creeping rootstock push up long spongy stalks which sheathe it with their bases, and above carry each a trefoil leaf of three fleshy leaflets with thick, whitish midribs—leaves not unlike those of the broad bean, for they are oval, simple, and of a plain outline. It is this resemblance, coupled

Wild Flowers as They Grow

with its hydrophilous proclivities, that has given it several of its common English names, such as "Marsh Trefoile," or "Marsch Claver," by which William Curtis knew it, "Water Trefoile," or "Marsh Trefoile" of Gerard (Lyte, a trifle earlier, preferred to spell the last "Marrische Trefoil"), "Beck-bean," "Bog-bean" (a very common Scotch name), and "Brook-bean." The sap of the leaves is intensely bitter, and infusions made from them were at one time favourite remedies for agues and fevers of all sorts. "It seems as though Providence had kindly placed the remedy in those situations most productive of agues," says a century-old herbal, adding that "in the last war the Germans made use of this plant, with almost unvaried success, instead of bark." It had a great reputation too—a reputation of very old establishment—for curing gout, rheumatism and scorbutic diseases. The celebrated Dutch physician, Boerhaave, said he had cured himself of gout by drinking it with whey, indeed, its most generally accepted name, Buckbean,

The Buckbean

contains a veiled allusion to its anti-scorbutic qualities. For the word "Buckbean" is derived from the Dutch *bocksboonen*, i.e. a plant used as a remedy against *scharbock*, or scurvy, which word is itself a corruption of the Latin *scorbutus*, the scurvy—the derivation is Dr. Prior's. "Buckles-beane" is, no doubt, its oldest English name. Even on the medical side the plant seems to have been, in this country, a little underrated, for we find Dr. Thornton urging a few years later than William Curtis that it "merits more attention than it has as yet received from English physicians." Its dried leaves were sometimes used as a substitute or adulterant of hops, 2 oz. of the former being considered equivalent to 1 lb. of the latter.

At length we turn to the plant's chief glory, those beautiful flowers, which once made Battersea Meadows so gay. They stand out above the leaves as a spike of pink and white on a naked stalk, perhaps a foot or so high, each stalk rising from within the sheathing base of a leaf. At the top

Wild Flowers as They Grow

of the spike are crimson buds ; the opened flowers are much paler, for the petals, though pink without, are whitish within. But it is not the colour that strikes the eye and arouses interest at the first glance, but a most curious fringing that marks the whole centre of the corolla and gives the flowers a dainty, feathery appearance. The tips of the five petals are smooth, curving delicately backwards, but just above the funnel-like tube into which they unite is a dense tuft of white, thick, upstanding filaments, slightly streaked, the like of which one cannot recall in all our British plants. These rather freakish, and altogether charming, developments may serve two purposes. They may, or rather certainly do, add to the attractiveness and conspicuousness of the flowers and, further, they form an efficient barricading to any small, unwanted insects who might chance to wander in that direction ; perhaps, too, to some extent, they shelter the pollen from rain.

The pollen is beautiful, being of orange-yellow hue, each grain ringed round with many delicate

The Buckbean

lines. It is produced in the anthers of five stamens, which alternate with the five lobes of the corolla. When the anthers open, which they do on the inside, to allow the pollen to escape, their halves separate a little at the base, so that they become of swallow-tailed form. In the centre of the flower, within the funnel of the corolla, is the globular seed-case, carrying a style topped by a thickened stigma.

But the Buckbean tends to elaboration and often, but not always, its flowers are of two kinds—dimorphic—like those of the primrose. Some carry their stigma at the top of a long column, some at the top of a short one, hence we speak of the long-styled and the short-styled form of flower. In the long-styled the stigma stands well out beyond the corolla tube, in the short-styled it never rises above the mouth of the funnel. The stamens are short where the style is long, and vice versa, and, of course “legitimate crossing,” i.e. the method of fertilisation aimed at by the plant, is for pollen from the long stamens to fertilise the long-styled stigmas,

Wild Flowers as They Grow

and from the short stamens to fertilise the short-styled stigmas. When the bud first unfolds only the stigma is mature, the anthers are as yet unopened, but within a very short space of time, possibly only hours, the anther-halves open and present their characteristic swallow-tail appearance. Thus in every plant there is, at any rate, a short space of time when only cross-fertilisation is possible. The plant is not greatly visited by insects; a few bees, a beetle or two, and some flies at rare intervals, are the only records of its visiting list, even though there is honey at the base of the ovary. It is asserted that self-fertilisation may also sometimes take place, even before the flower opens—this is specially the case when the unclosing of the bud has been delayed by wet weather.

Flowering over, a spike of reddish-brown capsules the size of peas, each still clasped by the remains of the five-lobed calyx, takes the place of the beautiful flowers. The capsules open at the top by five valves and reddish-brown seeds are swung

The Buckbean

out, which seed, we are told by Dodoens (1517-85), "is good against the cough and other colde diseases of the breast to be taken with Meade or Hydromel," (i.e. honey and water).

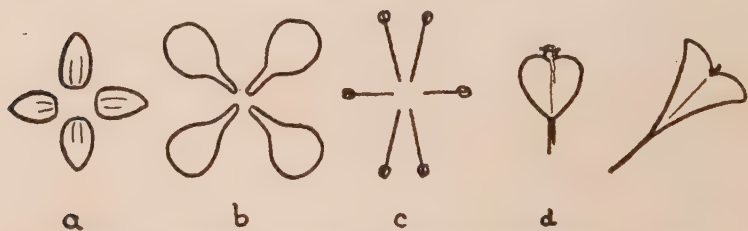
The Latin name *Menyanthes* signifies that it is a "month-flower," a flower that lasts a month; but this is considerably overstating the case so far as this country is concerned. The Buckbean blooms towards the end of May. It may be found in the company of sedges, comfrey, forget-me-nots, and bur-reeds at the border of meres and rivers, as well as in marshes. In Ireland it is sometimes known at the "Jagged Duck's Plant."

Finally, a century-old method of growing it in the house may be given. "Put the roots into a large pot (having holes at the bottom) filled with bog earth. Immerse the pot two-thirds of its depth in water in which it should continue. When coming into flower it can then be brought into any room and placed in a pan of water, where it will continue to blossom two or three weeks."

THE SHEPHERD'S PURSE

BURSA BURSA-PASTORIS
(*CAPSELLA BURSA-PASTORIS*)

“IN England it is called Shepherd’s Purse or Scrip from the likeness the Seed hath with that kind of leatherne bag wherein Shep-



a, sepals. *b*, petals. *c*, stamens. *d*, seed-case and stigma. *e*, fruit.

herds carry their victuals into the field”—while Royalists and Puritans schemed and plotted, William Coles, oblivious of a disordered realm, sat—“Adam in Eden”—happily discussing the habits and virtues of his beloved herbs. “Of some,” he continues his explanation (it is called), “Shepherd’s pouch



SHEPHERD'S PURSE

The Shepherd's Purse

and poor man's Parmacety, it being in some sort effectual for the same things that Parmacety is, and in the North Toywort, Pick Purse, and Case-weed and of some Clappede-pouch." The name "Clappede-pouch" is still in use to-day in Tweed-side, and has an interesting reference. When leprosy was rife in this land the wretched lepers sat solitary in huts by the wayside rattling a clapper and holding out a basin or pouch at the end of a long pole to crave alms of the pitiful. And the little plant in question, also holding out its pouches by the edge of the road, called to mind in olden days the poor begging leper—"Clappede-pouch." "Toywort," of course, also alludes to the toy heart-shaped purses; so, too, do other of its country names, "Mother's Heart," "Pick Purse," "Witches' Pouches," and the curious one "Pick-your-Mother's-Heart out." Other old names—"Dead Man's Oat-meal" and "Pepper and Salt" probably refer to the mixture of green buds and tiny white flowers.

One cannot honestly say that the Shepherd's

Wild Flowers as They Grow

Purse is anything much to look at, and yet if a well-developed individual plant be considered, one that is growing unhampered by vegetation around, one must admit a certain distinction of line about it. Lying on the ground there is a handsome star rosette of leaves—leaves much cut into fanciful shapes—and, rising from its centre, one or more fine stems, which carry little clusters of white flowers above and a succession of triangular seed-cases—the pouches—below.

The Shepherd's Purse has suddenly become of special interest, because within the last few years it has been made the subject of exhaustive research. It has always been a matter of common knowledge that, while its first leaves were simple and unlobed, its elaborately cut matured leaves varied considerably in the method of their lobing. So the plant was marked down for experiment in America,* and, in its way, it proved an ideal subject.

* By Mr. G. H. Shull at the Station of Experimental Evolution of the Carnegie Institution at Washington, U.S.

The Shepherd's Purse

In the first place its present forms are Nature unadulterated, no one has ever attempted to "improve" so plain and common a plant. In the second place it is extremely easy to breed, it has no special season, all are alike to it, provided its most reasonable requirements of light, warmth and moisture are met; and, thirdly, its life cycle is very short, so that one can quickly obtain a succession of generations to study. A ripe seed will germinate in from five to eight days after it has fallen from the seed-case (it needs no period of repose as so many seeds do), and within three or four months it will have produced leaf-rosette, flowers, and mature fruits, and a second generation can be commenced at once.

For this research twenty lots of seeds were collected from strikingly different Shepherd's Purse plants in various parts of the country, 200 pedigree families were established, and 269,000 individual plants dealt with. And the net result is that the plant called the Shepherd's Purse, which we

Wild Flowers as They Grow

consider a single rather varying species—indeed, a whole genus to itself—is really a composite species of four distinct individuals. That these four individuals are elementary types or biotypes (types of life) is proved by the fact that they each breed true and unvarying as long as no crossing among them is allowed. So when we look down upon a Shepherd's Purse it may be one of four distinct types, or it may be a hybrid between these four.

And these types are:—

I. *Heteris*.—*Bursa bursa-pastoris heteris*—to give



it its full and lengthy name—where the many divisions of the leaf are carried right to the midrib, the side lobes being long and thin, the end lobe definite and

Heteris. rounded. In the upper angle of each lobe—this is an important point—there is a secondary little lobe, as the diagram shows. This type is the commonest, and is probably the primitive one from which the others have evolved.

II. *Tenuis*.—*B. bursa-pastoris tenuis*.—Here the

The Shepherd's Purse

divisions are not nearly so deep, the lateral lobes are narrow, and there is no secondary lobe upon them. The end lobe is not cleanly cut out.



III. *Rhomboides*. — *B. bursa-pastoris* Tenuis.



Rhomboides.

rhomboides. Here the divisions are again right to the midrib, and the end lobe is cleanly cut out, but the lobes are all broadly angular or of rhomboid outline.

IV. *Simplex*. — *B. bursa-pastoris simplex*. The divisions never reach the midrib, and the lobes are all rounded.



Simplex.

Truly the distinctions of the mere lobing of a leaf seem trivial enough, and far less noteworthy than many deviations in other plants that are accepted as just unimportant variations, but the point is that they are four bed-rock types that will always breed true. They are a new exemplification, and a very interesting one, of those wonderful laws of

Wild Flowers as They Grow

heredity discovered by the Abbot Mendel in his monastery at Brün fifty years ago, which were practically unacknowledged and unappreciated until the beginning of this century. Cross one of these types with pollen from another of the same type, and all its descendants are of that particular type. Cross one with the pollen from another type, and the offspring of that cross will all be hybrids similar in character; then cross these hybrids among themselves and their offspring will be: some a pure type like one grandparent, some a pure type like the other grandparent, and the rest hybrids as the parents, and this *in definite and known numerical proportions*.

The Shepherd's Purse is one of the well-known order of plants, the *Cruciferae*, so its little white flowers have four sepals, four petals, and six stamens (four long and two short). Ten or twelve ovules lie in the flat heart-shaped seed-case with a short, thick stigma. Four honey sacs are present, one lying at each side of the two short stamens. Though

The Shepherd's Purse

flowers appear very early in the year it is said that they are not complete and perfect until April. They are always in a flat cluster at the top of the flower-stalk—they would indeed be insignificant otherwise—though the stalk continues to grow and carries the maturing seed-cases well apart after the flowers are over. When the petal tips first uncloset it can be seen that the ball-like stigma is just at the opening, and the four long stamens stand close up to it. But it seems as though this plant, at any rate, in spite of the clustering of the flowers, its honey, and its many visitors, both flies and bees, does not really care about cross-fertilisation. It has been lately shown that the underside, as well as the upper, of the stigma, can receive pollen for fertilisation, and, secondly, that the stamens open towards the stigma while the flower is in bud, so that their pollen can fertilise the stigma before ever the little white petals spread to make their pitiful show. Perhaps just an occasional cross-fertilisation takes

Wild Flowers as They Grow

place through the agency of insects, but, no doubt, as a rule, self-fertilisation is performed at the very outset of the flower's life.

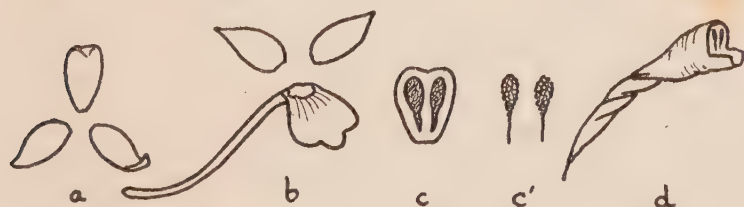
The Shepherd's Purse never found much favour as a plant of "vertue" with the old herbalists. Coles suggests that it may be used to stop bleeding at the nose "by holding the hands full of it, by binding it about the neck, or by using it in meats"; and although he also states that it is called "Poor Man's Parmacety," because it could give to poor men a substitute for the expensive spermaceti, "the sovereignst remedy for bruises," yet Dr. Prior asserts that the name is just a joke on the Latin name, *bursa*, a purse, "which to a poor man is always the best remedy for his bruises."

Though the plant is really European, it has now travelled over the Atlantic, and forms one of the commonest of American weeds.

THE FRAGRANT ORCHIS

*HABENARIA CONOPSEA, OR GYMNADENIA
CONOPSEA*

VERY fragrant with a sweet scent as of carnations, the purple spikes of the Fragrant Orchis outstand with peculiar charm in



a, sepals (coloured). *b*, petals. *c*, anther on column. *c'*, pollinia.
d, twisted ovary, column.

the June sunshine. A superficial observer might possibly confuse them with spikes of the Pyramid Orchis (*see* Vol. III.) in a late stage of growth, but besides the fact that they come a trifle earlier than does the "Pyramid," they are marked off with great distinctness by two special features. First

Wild Flowers as They Grow

there is their fragrance, unmatched among our British orchids, secondly each flower possesses a spur of exceptional length in proportion to its size. Very long and very thin is this spur, and as it curves backwards from the face of each of the twenty to forty flowers that grace each spike, the whole of the main axis seems laced about with delicate purple lines. Hence its country name—"Longtails." A certain shading of coloration adds to the charm of the whole, for at the top the oncoming buds are crimson, the newly opened flowers below them are a paler purple, while the withering flowers still lower on the axis are pale lilac in hue. When, as sometimes happens in happy situations, the whole spike of flowers is as much as a foot in length, it is not too much to say that few indeed of our native orchids can rival it in charm.

What precisely is the ideal situation for it is a little difficult to define. It seems sometimes to prefer chalky ground—chalk downs and chalk



FRAGRANT ORCHIS

The Fragrant Orchis

pits—where the soil is dry and the sun has free access ; at other times one finds it revelling magnificently in marshes, and even morasses, while it is also spoken of as growing in the “wildest luxuriance” on damp heathy Irish shooting grounds, or in heathy meadows by Perthshire rivers where hundreds of specimens may be found in a few square yards, “many two feet high, highly attractive, delicious, fragrant.” Where it takes, there it will grow without stint, and it is advocated as a very desirable garden plant not at all difficult to cultivate in a mixture of loam and some lime. It seems a thousand pities that the possibilities of cultivation of our native orchids are not more exploited. At any rate the Fragrant Orchis does not seem to be exacting in its requirements.

Each individual flower of the spike appears at first sight to have a short, thick, twisted stalk, but this is the long ovary which is set right down on the main axis, the flower being really stalkless. A single, attendant, narrow green bract wraps

Wild Flowers as They Grow

round the ovary, and is as long, or perhaps a trifle longer, than the whole flower. There are three purple sepals in each blossom, one arching over at the top, the other two spreading, one on each side; there are three purple petals—two small, standing right and left, curving protectingly over the centre of the flower, and one central, large, remarkable, which in front projects as a three-lobed lip, as broad as it is long, and at back forms the long characteristic spur already referred to. This lip serves as an alighting platform for insect visitors, and balances, as it were, the uppermost over-arching sepal. One must remember when one speaks of "top" and "bottom" of an orchid flower that Nature has given the flower a complete twist, as one can see by the ovary, so that what should really be the top of the flower has come to be the bottom, and vice versa.

If now both sepals and petals be carefully removed a most curious structure is left, to wit the twisted ovary, topped by a thick white structure

The Fragrant Orchis

with back and arms like an arm-chair. On the "back," in parallel thin tissue cases, stand two stalked pear-shaped masses of pollen—the pollinia—acrobatic twins, as appears later. Each is set on a narrow viscid, naked disk. (Hence the Latin name *gymnadenia*, i.e. naked gland, because in most orchids these disks are enclosed in pouches). They are slightly arched here, and together they form the roof of the entrance into the honey-filled spur. The "arms" are the two stigmas destined to receive pollinia from elsewhere, and in anticipation of which they will, at the crucial moment, exude a gummy substance that will hold what they annex. They form the sides of the porch to the spur.

The Fragrant Orchis is a transitional form between moth and butterfly flowers, partaking of the qualities of both, and, in fact, no fewer than twenty-six species of butterflies and moths have been seen visiting it. Only insects of this kind have proboscides long enough and thin enough

Wild Flowers as They Grow

to enter the long spur and sip the honey. They come and hover, thrusting each its proboscis down the spur, its head striking the viscid narrow disks on which the twin pollinia stand. These adhere to the insect's head as it withdraws itself satisfied from the honey, and the pollinia, slipping easily out of their cases, balance, leaning slightly outwards, on the proboscis. But only for a few seconds are they erect, within a minute they are lying head foremost along it. Sometimes, it is true, a moth comes away with only one pollinium lopsidedly on its proboscis. This is because it did not hover exactly in front of the flower, but entered the nectary somewhat sideways, so that only one disk was touched. The silver Y-moth and the yellow underwing specially frequent this plant.

At the next flower visited the prostrate pollinia now perforce strike the stigma arms, and, inasmuch as the elastic threads that bind the pollen grains into the pear-shaped heads are weak, the masses are apt to come to pieces, and only a part of them

The Fragrant Orchis

is left adhering to the receptive sticky surface. That cross-pollination is usually brought about was apparent to Darwin, for in a spike of forty-five flowers he found no fewer than forty-one of them had given and received pollinia, while on a spike of fifty-four flowers all but two had been visited. The plant cannot pollinate itself. After fertilisation the ovary becomes a dry capsule containing very many seeds, seeds so minute that they have been likened to sawdust. These capsules slit to allow the seeds to escape, but they only open in fine weather; on rainy days they close so that their many tiny dry seeds should not become waterlogged.

The leaves of the Fragrant Orchis are long and narrow, clasping the stem.

It is probably this Orchid that Dodoens had in mind when he described "The Greate Royall Satyrion—or Noble Satyrion"—whose "flowres grow in a spiky bushe or tuffet at the top of the stalke, of a light purple colour and sweete savour."

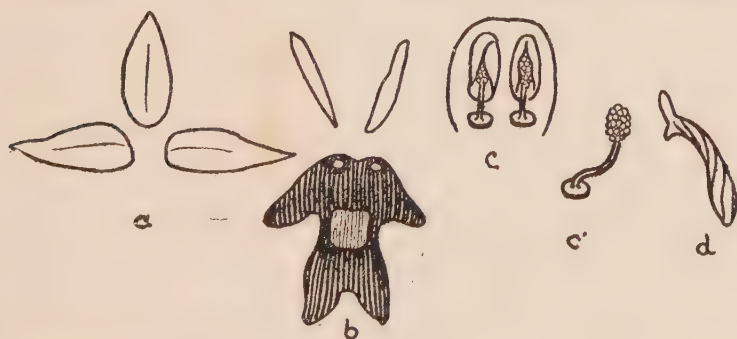
Wild Flowers as They Grow

He shows the long spurs right well in his diagram of the plant. Well, too, are its lobed tubers shown, which he describes as like to a “payre of handes, and each parted into three or five small roots like fingers, whereof one is withered, light and spongee, the other is full and sounde.” There was an old superstition that if two people ate of the sound one great affection would spring up between them; if of the flabby one the feeling would be one of aversion. Therefore orchid tubers once figured largely in love philtres and jealousy potions. This formation of the tubers gave the plant the old name of “Palma Christe.” It was also called “Royall Stander-grasse.”

THE FLY ORCHIS

OPHRYS MUSCIFERA

EVEN the most purposeful man jokes at times, though he may only “joke wi’ deeficulty.” So Nature, usually stern in pursuit



a, sepals (coloured). *b*, petals. *c*, anther on column. *c'*, pollinium. *d*, ovary.

of aim, would seem, now and then, to indulge in phases of sly humour, though the humour, maybe, is a trifle forced. Such a phase comes to light in that astounding little set of plants, the Bee (see Vol. I.), the Fly, and the Spider Orchids.

Wild Flowers as They Grow

For here are three plants so closely allied in structure and habit that they naturally fall into the same botanical group, which have each set out, apparently, to imitate an insect with such fidelity that the resemblance, at any rate in the two first-named, cannot fail to strike the most casual observer. The humour is not in the efforts at resemblance, for they are in no sense caricatures, but in the significance that may be involved in it. Is there any meaning, or are they mere "nonsense rhymes" as it were, which tease by apparent sanity on the surface and wholly elusive sense beneath?—

" My lustrous orchid, rather flesh than flower,
Some rich exotic beetle, gaudy fly—

But thou dost swing with speckled flag unrolled
With glossy belly, stiffened wings outspread,
Like some outlandish beauty, bought and sold
To please a princely head.

A tortured spirit in a feverish dream
Spinning strange fancies to beguile his pain,
Surely conceived thee, 'twas the wandering gleam
Of some o'erweighted brain."

(E. F. BENSON, *The Orchid.*)



FLY ORCHIS

The Fly Orchis

A suggestion has been made that they resemble insects with a view to discouraging their visits, for naturally insects in search of honey and pollen would not visit others of their own kind. But, as will appear later, this is the last object that would seem should be the plant's. Old John Parkinson indeed said with reference to the Fly Orchis "the natural flie seems so to be in love with it, that you shall seldome come in the heate of the daie but you shall find one sitting close thereon," but unfortunately modern scientific observation does not endorse the statement of the herbalist. Lord Avebury is emphatic on this point. "The plant is sometimes abundant in my woods," he says, "but I have never seen an insect visiting them. In one case there were a group of over a hundred all within five yards of one another, and I watched them for an hour in the middle of a bright summer's day, but not a single insect came." Still, he adds that Darwin found that a few insects occasionally visited them. So the why and where-

Wild Flowers as They Grow

fore of the resemblance remains very much a mystery.

The Fly Orchis is the commonest of this conundrum three. It may often be discovered sheltering under bushes on chalk downs, for it is a great chalk-lover ; it is also quite at home on clay soil in damp woods, or again it is very partial to low-lying peaty land where heather grows and where some slow-moving stream soaks the soil. It is a slender little plant, rarely more than a foot high, just a main unbranched stem carrying three (usually) narrow stalkless single leaves near its base, and a spike of three or four flowers at top. The flowers are placed a little separate one from the other, and the general effect is remarkably like three or four house flies settling on the stem.

The three greenish sepals stand for the head portion and the wings ; the two side petals are very narrow and coloured, and project on either side of the top " head " sepal, as though they were antennæ. The third large " lip " petal, or labellum,

The Fly Orchis

the lowermost and central one, represents the body of the insect ; it is purplish brown, of velvety surface, and marked in the middle by a square patch of pale blue. On each side of its base is a bright spot, almost like a metallic button, which increases the attractiveness of the flower, and is supposed to be a " sham nectary " to deceive insects. The idea of sham nectaries was originated at the end of the eighteenth century by Sprengel. Darwin scouted the suggestion, but said that if ever he could have believed in them it would have been in the case of these gleaming " buttons." Lord Avebury asserts his belief in Sprengel's theory. The flower when it first opens does, however, produce a minute quantity of real honey in a furrow down the centre of the labellum, but this quickly dries into a thin damp layer, which shortly disappears altogether. In addition to the coloration, the resemblance to the house fly is enhanced by the convex shape of this petal, added to the fact that it is three-lobed, the two small side lobes being turned down

Wild Flowers as They Grow

and the centre lobe notched. There is no spur to this petal as there is in so many of the orchids. In the centre of the flower is the "column," a combination of the single anther, and two of the three stigmas. The anther contains, in a pair of pouches, a couple of pollinia, each of which consists of a pear-shaped mass of pollen, bound together by elastic threads and supported on a doubly bent stalk (*see* diagram). The third stigma is transformed into a sticky organ known as the rostellum which, in this orchid, is in two parts.

Darwin made various experiments and observations on this plant. He discovered that it was impossible to shake the pollinia out of their pouches on to the stigma, so he came to the conclusion that the plant could not fertilise itself, an opinion not universally held by botanists. Apparently the proper plan of action is for some small insect to crawl up the labellum towards the centre of the flower, and to stop and examine and, perhaps, probe into and suck the two sham nectaries, or buttons.

The Fly Orchis

In doing this its head pushes on the bent stalk of one of the pollinia, which promptly slips out of its pouch and adheres to the insect's head. Then the pollinium begins to bend very slowly over forwards, taking six minutes to do what is done in a few seconds in many orchids, viz. to get into the horizontal position. It, however, never lies straight "head on" because of the two kinks in its stem. The next flower visited by the insect receives this pollinium, for it adheres to the sticky stigma.

Therefore, as the visits of insects are evidently desirable—if not, as Darwin thought, quite indispensable—it is strange to find how little the plant is visited by them. Out of 207 flowers he found not half had been visited at all, and of the 38 which had been visited only one pollinium had been removed in 31 cases. That is to say in only about 25 per cent. did Nature's mechanism act fully and satisfactorily. Again, out of eleven plants under observation, six did not produce a single

Wild Flowers as They Grow

seed-capsule, and in the remaining five there were altogether only seven capsules. Truly as Darwin said "something seems to be out of order in its mechanism or its conditions."

The seeds of orchids are extremely minute, almost dust-like in fact, so that, of course, from a single capsule a great number of new plants might arise, and presumably they do so here, since the Fly Orchis is quite abundant in certain districts. It is in flower from May to July.

From the herbalist's point of view this "Serapias Orchis Stones" or "Ragwurtz" was of little value, though occasionally we hear of "Flie Orchis boyled in wine" being employed to some slight extent medicinally.

All the three British insect-imitating plants which form the genus *Ophrys* of the family *Orchidaceæ* are very difficult to cultivate, unlike many other of our native orchids which so easily respond to care and attention in a garden. In fact in every sense they are capricious as to action and inexplicable

The Fly Orchis

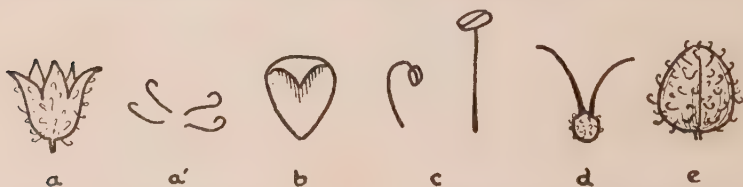
as to intention, so that we conclude with the premise with which we began that they must chiefly be regarded, as Gerard quaintly said long ago, as “pleasant and beautiful floures wherewith Nature hath seemed to play and disport her selfe.”

THE WOOD SANICLE

SANICULA EUROPÆA

*"Celui qui sanicle a
De mire affaire il n'a."*

quoted the folks of the Middle Ages, which rhyme, written down by the French physician, John Ruellius,



a, calyx. *a'*, hairs of calyx. *b*, petal. *c*, stamens (first and second stages).
d, seed-case, styles. *e*, fruit.

about 1480, was turned into an English proverb as "He that hath Sanicle needeth no surgeon," or in an amplified variation

"Who Bugle and Sanicle hath
May safely at the surgeons laugh."

For, as Lyle tells us, "The juyce of Sanicle dronken doth make whole and sound all inwarde and out-



WOOD SANICLE

The Wood Sanicle

warde woundes and hurtes," or as Langham quaintly remarks in his "Garden of Health" (1579), "The herbe gleweth up greene wounds." Culpepper is more grandiloquent, "This is one of Venus' herbs to cure the wounds or mischiefs Mars inflicts upon the body of man," he wrote. Therefore is the plant's very name Sanicle supposed to imply healing, and it is popularly said to be derived from the Latin verb *sano*=to heal or cure, but whatever be the virtues of the plant it does not really proclaim them in its name, for the word Sanicle has a far more romantic origin. The plant is the herb dedicated to St. Nicholas, and "Sanicle" is merely a corruption of the saint's name in German form—Sanct Nickel.

There is a gruesome legend that during a great famine in the fourth century an innkeeper murdered two little children, and pickled their bodies in a pork tub. This awful crime coming to the knowledge of the saint, he prayed, and made the sign of the Cross over the tub, and brought about the

Wild Flowers as They Grow

restoration of the children to life. Even though the legend is but a crude allegory expressing the conversion and baptism of sinners, yet the suggestion of curing, with the saint as the healer, led to his herb being specially associated with the healing of wounds.

The Sanicle is a plant of the woods, loving shade and moisture, and sleeping through the winter under a blanket of leaves. Though it is common enough, it is not one of those plants that thrust their personality upon one's notice, and so it is not known and recognised to any degree commensurate with its abundance. A herb a foot or two high, its glossy handsome leaves arise singly upon long stems from the root for the most part, though an odd one or two are to be found upon the flower stems. In general outline they are very broadly heart-shaped, though they are cut right down to the base into five segments, each of these segments being again somewhat lobed, and the cutting carried still a stage farther, in that the margin throughout is finely nicked.

The Wood Sanicle

In May and June the flower-stalks bear little white fluffy balls of flowers that are each not much bigger than a marrow pea. It is indeed sad that such interesting flowers should be so small that an investigation into their structure, and a comprehension of their ways is difficult. It is a case of "many men, many minds," with this plant, for botanist after botanist announces conclusions from which his brethren dissent. Perhaps it is not only the minuteness of the individual flowers that has helped to create the confusion, perhaps it is that the flowers vary greatly in their ways and structure, indeed this latter must be the case, so differently have they been described by acute observers. But all agree that two kinds of flowers make up the little white balls, namely perfect flowers with stamens and seed-case, i.e. hermaphrodite flowers, and imperfect flowers with stamens only, i.e. male flowers. Kerner found that each ball or "umbel" had three perfect flowers in its centre, with eight to ten male flowers round them like a wreath.

Wild Flowers as They Grow

Now if one look with great care at a perfect flower one can see a five-rayed calyx carrying thick reddish hooked hairs on the outside, and five petals, whose tips are turned in, while in the first hours of the flower's life five stamens seem like five white loops, for they are bent right over so that their heads are hidden down within the centre of the flower. Later they raise themselves and spread outwards, giving a spiky appearance to the ball. Within is a seed case, round whose top is a collar of honey-producing tissue. Kerner also found that in the perfect flowers the styles were mature before the stamens, hence the flower was female in the first stage of its existence, and male in the second. Therefore at the outset, if fertilised, it must needs be with pollen from another flower ; even when the stamens straighten themselves they lean outwards, far away from the styles. In the next stage the stamens wither and fall off, but the styles diverge and curl over, and, since the flowers are so tiny and so close together, these curly stigmas touch the long

The Wood Sanicle

stamens of the surrounding ring of male flowers, and thus are fertilised, if not fertilised already by the flies and beetles that frequent these flower-balls for their honey.

Other observers, such as Müller, say, however, that there are only one to three perfect flowers in each head, and ten to twenty male ones, and that in the perfect flower the stamens are mature before the stigmas, that is the male stage precedes the female stage. Still another keen botanist states that he found only male flowers, not perfect flowers, in the centre of the balls.

As the blossoms fade the hairs on the calyx greatly develop, so that the "many small round buttons full of littell white flowers" of which Lyte wrote, "do turne into small rough burres which is the seede." These burrs will cling to clothes, fur, or feathers by virtue of their midget hooks, and thus the plant disperses its fruit far and wide.

Sometimes the flowers instead of being white

Wild Flowers as They Grow

are pink or brownish pink. Always at the base of each ball or umbel is a ring of small narrow green bracts. The plant is placed in the family of the *Umbelliferae*, though in its case, as in that of the sea holly, the flowers are not all brought up to quite the same level as is usually done. Its sap is rough and acrid—a common characteristic of plants of this family—and it is sometimes known by country folk as “Self-Heal,” and “Wood Mard.”

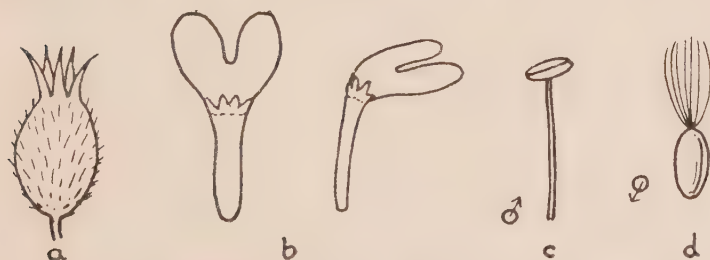
THE RED CAMPION

LYCHNIS DIURNA (OR DIOICA)

WELL, indeed, is the Red Campion dedicated to

“that shrewd and knavish sprite
Call'd Robin Goodfellow,”

for wherever it grows, whether as great warm patches in the lush ground by the river, or in



a, calyx. b, petals. c, stamens in ♂ male flower. d, seed-case and styles in female flower ♀.

smaller groups by the ditch-side, or more or less solitary in the hedgerows, its very presence conjures up gaiety and invites mirth. The rose-red blossoms are so bright and frank in their appeal,

Wild Flowers as They Grow

so challenging in their outlook, that no one with understanding of plant nature can pass them by without recognition of their roseate perkiness. All the children know by instinct that the plant must be a "robin" of some sort—"Red Robin," "Robin Flower," "Robin Hood," "Robin-in-th'-Hedge," "Robin Redbreast," "Round Robin" (in contradistinction to the Ragged Robin, *Lychnis Flos-cuculi*), "Cock Robin," for these are some of the names by which they know it—and colour again underlies the idea in names such as "Red Jack," "Soldier's Buttons," and "Bird's eye," or "Brid ean."

But besides vividness of appearance it has vividness of personality, with many outstanding features. An Esau-like hairiness, for instance, distinguishes it; its sturdy green stems are roughish to the touch from the hairs sparsely scattered upon them; its pairs of broad ovate leaves are positively flannel-like from the thickness of their hairy coat, while even the pink ten-rayed star



RED CAMPION

The Red Campion

of the petals emerges from a rough red calyx. The leaves, by the way, are stalkless, and their bases clasp the stem and overlap around the stalk so that in the medium stage of their growth they almost form a cup. (In plants such as the teasel a further development on these lines leads to the bases of opposite leaves fusing and making a definite water-holding cup.) It has been pointed out that if the stalk is held against the light and on a level with the eye, a very close resemblance can be seen in the two curving leaves to arches springing from the top of a pillar.

Then again even a cursory examination of a number of the flowers of the same age on different plants reveals that not all the plants are alike in their flowers. On some plants a white coil shows just inside the mouth of the petal tube, on other plants several see-sawing stamen-heads are barely visible. From these signs he who runs may read the fundamental fact that the Red Campion plant bears two quite distinct and different

Wild Flowers as They Grow

kinds of flowers, one plant one kind, a second plant another, but not both kinds on the same plant. Therefore it is often known as *dioica*, "of two kinds."

If we trace the flowers from an early bud stage to the ultimate withering, we learn various curious and interesting facts. Take first a young bud on a stalk where the flowers have stamen heads in their centre; at this stage it is closely enfolded by the hairy calyx which is green with a little red at the tip. Open it and you find that the petals standing folded one with another are here perfectly white. The little stamens in the centre are greenish-white. Take a little older bud which is just beginning to split at the top and—behold!—the glimpse one gets of the petals shows them to be now of the warmest pink. Directly the sun's rays touched them they blushed, their tissues became transfused with rosi-ness. Rapidly the petals lengthen, forming a tuft; this then opens out into a ten-rayed disk.

Slit down through a flower. The rough calyx is made up of five sepals slightly bulging. Though

The Red Campion

they are joined side by side, ten strong ribs mark the lines of union and the midrib of each, and their five tips stand up distinct and apart. The petals, five in number, are not joined in any way, and, since the calyx ribs form so strong a support, their lower part is delicate and white (or is it because the petals are so fragile and incapable of supporting themselves that the calyx has braced itself so strongly?). Each rose-red petal claw is deeply notched in the centre, and just where the claw spreads back from the fragile limb a little frill of paler tissue rises, and the frills of the five together form a crown, the "corona" of the petal tube. The stamens are ten in number, their filaments are poor thin things, no doubt they too rely on the braced calyx. Their anthers are also thin, delicate and long, and inasmuch as they are attached in the centre of their length they rest across the filament top and will see-saw at the slightest touch. A very rudimentary and useless seed-case completes the structure—it is purely a male flower.

Wild Flowers as They Grow

Now turn to a bud on a stalk that carries the female flowers. Here in its very earliest stage, before there is a trace of the petals to be seen, tiny threads—stigmas—thrust themselves through the tip of the enclosing calyx like five white tongues. Already the flower is about its business, losing no chance of annexing any stray grains of pollen, though it has not yet begun its active campaign of attraction. In the full-grown female flower the only distinction, but a vital one, between it and the male flower, is that there is a substantial green seed-case, from the top of which five sturdy styles arise, and no stamens, or only rudimentary ones.

The Red Campion is a favourite flower of the bees, and they suck the honey at the base of the petal tube, and incidentally act as a medium of communication between the sexes. It is interesting to note that in the White Campion (Vol. III.) a variety of the same species, which seeks by scent and pallidness to attract visitors from among the

The Red Campion

moths, the petal-tube is longer than in the red flowers, since moths have longer proboscides than bees. The specific name *diurna*, as opposed to the specific name *vespertina* of the White Campion, emphasises the fact that the one is a day flower closing at night, the other is a night flower closing by day. Four days is the length of life assigned to each red flower; on the evening of the fourth day its career ends. And as the male flowers fade they shrivel and fall away, but in the female flowers, though the petals droop and disappear, the calyx remains to protect the swelling seed-box, and for long the faded styles still press beyond its apex.

By degrees the seed-box becomes a dry, pointed capsule full of seeds. It is held erect, and eventually on a fine sunny day its summit slits down a little in five places, and five teeth roll back, and as the wind sways the capsule the seeds are jerked out in tiny spurts. But mark the cunningness of the plant; if the weather turn bad the dampness causes the teeth to roll back again

Wild Flowers as They Grow

and securely close the capsule once more. Under propitious circumstances they will turn back afresh, but the Red Campion has no intention of getting its little seeds waterlogged, even if it does produce them with great prodigality—a single plant will produce no fewer than three thousand seeds, all potential offspring. The very curious belief was once held that “The seede and floures with the whole herbe of the wilde Campions are very good against the stinging of Scorpions, insomuch that their vertue is so great in this behalfe, that this herbe onely throwen before the Scorpions taketh away their power to do harme.”

If trees fall, or a clearing be made in a wood for any cause, the Campions, in company with bluebells, woodruff and stachys, are the first flowers to appear, foxgloves, thistles, and nettles coming a little later. This is often called the “Campion stage” in the regeneration of a clearing. And if matters are left to nature the second stage will be that of the bramble, the third that of the hawthorn,

The Red Campion

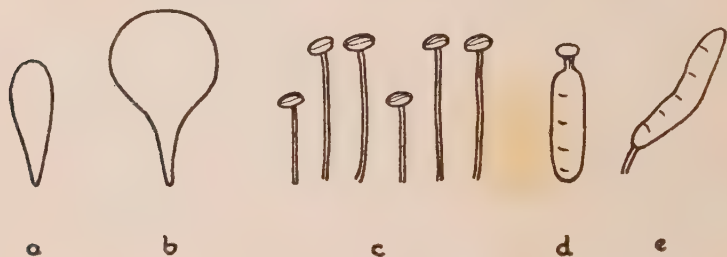
rowan and birch, and ultimately back to forest trees once more.

The Red Campion belongs to the clan of the pinks, the family *Caryophyllaceæ*, and as for the time of its blooming do not the Devonshire folk call it the "Geukey Flower?" "Because them in blume when the Geukey do come." The "Geukey," of course, being the cuckoo.

THE WATERCRESS

NASTURTIUM OFFICINALE

FROM time immemorial the slight and pleasant pungency of the leaves of the Watercress has given the plant a status all its own. The



a, sepal. *b*, petal. *c*, stamens. *d*, seed-case, style, stigma. *e*, fruit.

ancients ate the leaves because they believed that decision of character was acquired thereby; the old herbalists of the Middle Ages recommended them wholesale for all conceivable—and inconceivable—diseases. In those incomparable items of knowledge “gathered by the long experience



WATERCRESS

The Watercress

and industry of William Langham, Practitioner in Physicke," and shared by him with the world in general about 1579, through the medium of his book "The Garden of Health," we find no fewer than twenty-nine diseases which "Watercresse" might be expected to cure, from dropsy which required the patient to eat "three crops" a day, to a bad complexion which merely asked for the simplest external treatment. Culpepper, nearly a hundred years later, after remarking that "it is a herb under the dominion of the Moon," says, "Water cress pottage is a good remedy to cleanse the blood in the Spring and help headaches, and consume the gross humours that winter has left behind," and adds, with a pungency that matches the herb's, "those that would live in health may use it if they please; if they will not I cannot help it. If any fancy not pottage they may eat the herb as a sallad." Age did not stale nor custom wither the tale of its virtues, for a well-known herbal published within a century of our own day

Wild Flowers as They Grow

tells how "the admirable Author of the Edinburgh New Dispensatory" not only prescribed the expressed juices of Watercress, but urged, with an enthusiasm that strikes one as a little overdone, "that it should, at the same time, be eaten at breakfast, also at dinner, and for supper!" No wonder that it found a place in those "London cries" of long ago.

"Here's pennyroyal and marygolds
Come, buy my nettle tops
Here's water-cresses and scurvy grass
Come buy my sage of virtue ho!
.
.
.
Here's dragon's tongue and wood-sorrel
With bear's-foot and hore-hound
Let none despise the merry, merry cries
Of famous London town."

No wonder, too, that to-day many thousands of tons continue to find their way annually up to London Town to supply the never-ceasing demand of the great city for its Watercress.

But the tender little green shoots that are so tightly packed into baskets for Covent Garden give

The Watercress

little hint of what the plant is when left to develop as Nature intended. A plant just taken from a brook and laid before the writer, has a hollow creeping stem, an inch and a-half in circumference, with a length of over four feet. On its lower side, at intervals of two or three inches, arise little bundles of white threads—the roots. About the middle of the long stem they are particularly abundant, behind that region the stalk is past its best, gradually deteriorating into a decayed yellow end; beyond, it is in its most vigorous section of growth. Branches or single leaves are rising, or have arisen, at every point where the roots spring; in fact, from an examination of the growing end of the stem it appears that tiny white filaments—embryo roots—arise in the angles between the leaves and the stalk. The leaves that arise on the upper side of the trailing stem are cut up into deep segments or even distinct leaflets—Gerard quaintly described them as “compact and winged, with many small leaves set upon a middle rib one against another,

Wild Flowers as They Grow

excepting the point leafe, which stands by it selfe . . . if it grow in his natural place, which is in a gravelly spring." They are brownish above, green below, "a perfect marke to know the physicall kinde from the others" (i.e. the true Watercress from other cresses), says the same writer. Occasionally a bud will form from the epidermis, and a new plant arise from the very surface of a leaf. This particular plant was perhaps rather a fine specimen for England, but in the virgin streams of the Antipodes where it has been introduced, it grows to far greater lengths—twelve feet is mentioned—and is thick in proportion, so that it becomes a regular nuisance, clogging up the rivers and preventing navigation.

The flowers begin to come in May and continue throughout the whole summer; they are white, and obviously of the cross or crucifer type, the plant being a member of the *Cruciferæ* family. They are in tight little groups on the ends of branches, the older open flowers surrounding minute buds.

The Watercress

Each has four lightly attached sepals, and four white petals with narrow limbs and wide claws, which claws spread back to form the arms of the cross ; four stamen heads, in two pairs, appear on a level with the cross, but there are two shorter stamens hidden lower down, which both possess a green fleshy nectary on the inner side of their base. The centre of the flower is occupied by a long pod, which ends in a little green stigma knob. At first this stigma is on a level with the anthers of the four long stamens, but later it grows beyond them. The stamens open on the side nearest the stigma, and visiting insects, chiefly flies and beetles, touch the stigma with one side of their bodies and the pollen-dusty anthers with the other. In the next flower entered in the reverse direction the pollen will be transferred to the second stigma. One observer records that he found the stigma was mature earlier than the stamens, and he noted that when the pollen had been all shed both filaments and empty anthers became of a violet hue.

Wild Flowers as They Grow

When the flower fades and the petals fall, the pod and its seed contents increase in size until ultimately the ovules can be distinctly seen through the walls, neatly arranged in two rows. The pungent juices not only range through stem and leaves, they also are particularly strong in the pods, as is evinced on biting one. This sharpness causes country children sometimes to know the plant as "Teng-tongues," "Crashes," "Carson," or "Carse." Other names of the plant come from its original Anglo-Saxon name *cærse*, which in Elizabeth's reign is found written "Kars." Chaucer wrote "Kers." It is probable that the curious saying, "It's not worth a curse," really is a misrepresentation of a saying "not worth a Kerse," i.e. a bit of watercress, an object of no value.

Though Watercress was always in demand it does not appear to have been actually cultivated in this country until the beginning of the nineteenth century, hence our present miles of carefully tended Watercress beds—for instance, the well-

The Watercress

known ones of Hertfordshire—all date from that time. In cultivation it is propagated by both seeds and cuttings. Cuttings three inches long are dibbled thickly into a moist ditch in the spring, they root in a week or so, and are then taken up and dropped, about nine inches apart, into a slightly flooded ditch, where they root themselves. As the plants grow more water is passed in. Little seedlings are dealt with in the same way. Frequent crops of the shoots are taken, as the plants grow rapidly. The shoots, all a few inches long, are neatly and tightly packed into wicker baskets known as “flats.” The heads of the shoots are placed in the centre of the basket, which is filled so full that the lid is always left open at about half a right angle. Hundreds of these characteristic half-open baskets may be seen by night at various London termini. After a time the crop deteriorates, for the plants are making an effort to flower. They are now useless for salad purposes, and are pulled up to make way for a fresh growth.

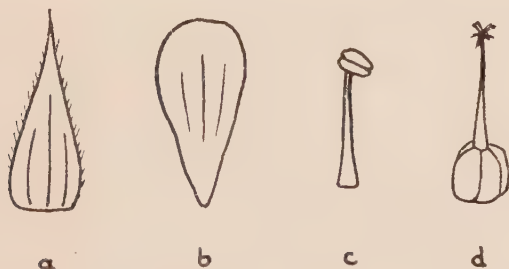
Wild Flowers as They Grow

The Watercress belongs to the not very well defined Nasturtium group of the great *Cruciferae* family. Other members of the group which are natives of Great Britain are the Creeping Watercress (*N. sylvestre*), the Marsh Watercress or Yellow Cress (*N. palustre*), a weaker edition of the previous plant, and the Great Watercress or Yellow Cress (*N. amphibium*), all three of which have yellow flowers, and are therefore distinctly marked off from our Common Watercress.

THE DOVE'S FOOT GERANIUM

GERANIUM MOLLE

THE Latin specific name, *molle* (Lat.: *mollis*, soft), gives the keynote to this Geranium, for it is indeed a “soft” Geranium, with a surface



a, sepal. b, petal. c, stamen. d, seed-case, style and stigmas.

as of velvet. Foliage and stalks passed over the lips run with a warm soft smoothness, almost that of the downy breast of a bird, for the whole plant is clothed with a vesture of white, silky and comparatively long hairs that spread upon the stems, lie shorter but thicker upon the leaves both fore

Wild Flowers as They Grow

and back, and even tinge the petals with delicate edging. Everywhere, in fact, are they in evidence.

A little plant, of weakly, trailing habit, that tends to lean upon the grass or other plants in its vicinity, it is rarely a foot in height, and green in the upper reaches, though its stems blush to redness towards the base. The lowermost radicle leaves are lifted high on long stalks, a necessary provision to enable them to breast the herbage around and get their share of the sunlight.

The shape of the leaves is pretty and characteristic. Imagine an almost circular leaf an inch or so in diameter supported at its centre on a stalk; imagine this soft, green disk slashed midway or so down into seven or more wedge-shaped pieces; imagine the outermost margin—the circumference—again cut into large deep teeth, and you have a leaf of the Dove's Foot Geranium. In the upper, smaller leaves of the flowering stems the slashing goes deeper than in the long-stalked leaves upon the ground. It is these leaves that give the plant



DOVE'S FOOT GERANIUM

The Dove's Foot Geranium

its name of "Dove's Foot" or "Culverfoot,"
Culver = a dove.

The flower buds are particularly hairy objects. They begin to appear in April, and keep on coming cheerfully and undauntedly all through the summer and on into late autumn. They are as willing to range through variations of the seasons as the plant itself is to range through variations of environment. For the Dove's Foot Geranium is one of the more common and universal weeds of our country, though the term weed is somewhat of a libel on so charming a little plant. It is found in damp hedgesides, it loves the fields, especially those that are in cultivation, and it climbs with alacrity the walls that surround them, nestling quite happily in the crevices between the rough stones.

The little flowers are always in pairs, and though their insignificance and soft colouring compare ill with the handsomeness and rich purple of the Meadow Crane's-Bill (*see* Vol. I.), or the still greater magnificence of the Blood Geranium, yet they are

Wild Flowers as They Grow

the size of a threepenny bit, and peep from the side of the path with little bright eyes of a purple—a reddish-purple—hue, a hue, however, that has nothing in it of the vivid redness of its brother, the ever-gay Herb Robert. The Dove's Foot Geranium, too, has not the strong characteristic smell by which Herb Robert declares himself to those who bruise or mishandle him.

The flower is of the typical Geranium type, with the parts all in fives—five ordinary green sepals, five petals, each notched, five stamens in an outer ring, five in an inner, all with purple anthers, and a five-lobed, five-celled ovary, the lobes ranged round a central axis that grows up from the stalk end, with five purple stigmas carried as a ring of five small branches upon a pointed projection from the ovary. Now when a hairy bud begins to open it can be seen that the petals are twisted within, also that the five stigma lobes are all pressed together in a bundle, so that their inner receptive surface is quite hidden. Directly the

The Dove's Foot Geranium

flower has opened, the outer ring of stamens stand erect and shed their pollen. At this stage, then, the flower is purely male, and all that the hover-fly visitors can do is to remove pollen as they probe for the nectaries that lie at the base of the stamens. However, as this phase passes, the stigma branches begin to spread, and by the time the stamens forming the second ring have raised themselves and opened their pollen boxes they, too, are in activity, and hence the flower is now both male and female. Finally the anthers stand actually between the stigma branches, so self-fertilisation is also possible.

The after-development of the flower and the behaviour of the resulting fruit is very remarkable. The central axis that ran up between the lobes of the ovary lengthens considerably, and carries up with it their pointed projections that originally ended each in a stigma branch. And now round the central column lie five dry lobes, each containing a single seed, and five projections from the lobes attached

Wild Flowers as They Grow

to the column, and thickening it in the lower part. The whole structure is like a crane's head and long bill, therefore are the Geraniums often known as the Crane's-Bills. Naturally as the central axis lengthens more than the styler projections do the latter eventually come to be in a state of great tension until at length they can resist no more, and they do the only thing possible, they suddenly snap both above where their tip joins the central axis, and below where they join the seed-chambers. Off flies the seed-chamber with the seed within it; off flies, too, the styler projection, curling as the tension is removed. Such a fling is given, so much energy is set free, that the seeds are often thrown to a quite surprising distance; the whole five are by no means all flung at the same moment, and we sometimes find fruit where two or three have gone and two or three hang on awaiting the critical moment. Well, indeed, are the Geraniums classed among those plants that carry explosive fruits.

The Dove's Foot Geranium is one of the plants

The Dove's Foot Geranium

that seem to have made no appeal to the imagination, it is bound up with no romance, it is sung by no poet, nor yet did it, apparently, attract the sympathetic consideration of the herbalists of old. Our interest in it lies purely on the botanical side. The only suggestive touch of romance about it is the pretty name of "Starlight" which has been given to it. Perhaps this lack of distinction is due to the fact that several of the twelve native species of Geraniums bear a very close resemblance. For instance, the Small-flowered Geranium (*G. pusillum*), and the rarer Round-leaved Geranium (*G. rotundifolium*) are frequently confused with it, but the seed capsules of the Dove's Foot are distinctly wrinkled, while those of the Small-flowered Geranium have a smooth, downy surface, and those of the Round-leaved Geranium are prettily dotted all over. The last-named also has no notch and no hairy edging to its petals, while in the Small-flowered Geranium the petal notches are but small, and the inner five of the ten stamens have no anthers.

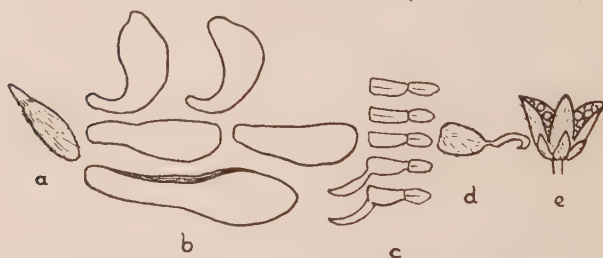
THE HAIRY VIOLET

VIOLA HIRTA

TO the poet all Violets are as one so long as they are fragrant and purple—

“ . . . violets dim,
But sweeter than the lids of Juno’s eyes
Or Cytherea’s breath.”

(SHAKESPEARE.)



a, sepal. *b*, petals. *c*, stamens. *d*, seed-case, style, stigma. *e*, fruit.

To the botanist, however, the genus *Viola* of the *Violaceæ* family is a maze of difficulty, a territory so marked by variation of contour that it requires the most careful of mapping-out, the most delicate of delineations. It is a territory, moreover, that



HAIRY VIOLET

The Hairy Violet

has been only gradually explored, and whose natural divisions have been but by slow degrees forced upon our notice. When Matthias Lobel, the Fleming, herbalist to James I., published his observations on plants in 1576 he merely mentions the *Viola purpurea*, or the Sweet Violet, and a variety of the same that was probably the species of Dog Violet, now known as *V. Riviniana*. In Gerard's "Herbal," 1597, we again find mentioned only two forms of wild Violet, the "Wild Field Violet, with long leaves . . . with flowers of a light blue colour" (one of the Dog Violets, *V. canina* or *Riviniana*) and another Violet "with flowers of a bright reddish-purple colour."

In the next century four kinds of British wild Violets were recognised, two new species being added. For the first of these we are indebted to a Master Stonehouse "a reverend minister of Darfield, in Yorkshire," who pointed out "a kind of wilde Violet neare unto his habitation . . . whose leaves were rounder and thinner than of others,

Wild Flowers as They Grow

and the flowers reddish, with sadder veins therein," to Mr. Parkinson, when the latter was completing his "Theatre of Plants" (published 1640). This was our Marsh Violet (*V. palustris*). The other kind was the Violet of our present sketch, the Hairy Violet (*V. hirta*), and it makes its bow on the botanical stage under the rather alarming announcement "*Violo Fol.: Trachetii serotina hirsuta radice lignosa*," in a little volume issued in the year of the Great Fire of London, 1666. "Charlton Wood, and in the lane leading to Sittingbourne," in Kent, had the honour of providing it for this début.

In the eighteenth century two more kinds of wild Violets were definitely sorted out of the *Viola* tangle and named—the Dog Violet (*V. canina*), by Dillenius in 1724, and *Viola lactea*, identified at Tunbridge Wells about 1797, but the latter is usually considered only a sub-species of *V. canina*.

Last century three additional species evolved—(1) the pale *V. stagnina*, found at Lincoln and described in 1839; (2) the Sand Violet (*V. arenaria*),

The Hairy Violet

also called *V. rupestris*, the Teasdale Violet, because it was discovered in the sugar limestone of the Upper Teasdale ; (3) the Wood Violet (*V. sylvestris* or *sylvatica*), a variety of which is sometimes called *V. Reichenbachiana*. Even in the present century, in spite of its youth, two new British species have been added by Mrs. E. S. Gregory, i.e. *V. Montana*, and *V. epipsila*. So that altogether there are some ten species of British Violets to be reckoned with ; the number cannot be given exactly, as botanists differ a little as to species and sub-species. But, in all, the world-wide *Viola* genus, including, of course, the pansies, now numbers some three hundred species, and since Linnæus a century and a half ago only knew of twenty-four, it is obvious that much patient research has taken place in the matter.

The name of the genus, *Viola*, is the equivalent of the Greek *Ion*, “ after the name of that sweete gairle or pleasant damosell Io, which Jupiter . . . turned into a trim Heaffer or gallant Cowe bycause that his wife Juno (being both an angry and Jelous

Wild Flowers as They Grow

Goddesse) should not suspect that he loved Ion. In the honour of which his Io, as also for her more delicate and holsome feeding, the earth at the commandment of Jupiter, brought foorth Violettes, the which after the name of his well-beloved Io he called in Greek Ion, and therefore they are also called in Latine, as some do wryte, *Violo quasi Vitulæ*, and *Vaccineæ*.” Thus quaintly does Lyte set forth the old legend in his translation of Dodoens’ Dutch “*Niewe Herball*,” 1578. But he adds, “*Nicander wryteth that the name of Ion was given unto Violettes bycause of the Nymphes of Ionica, who first of all presented Jupiter with these kindes of flowres.*”

As to the Hairy Violet in particular, though it is reported in a dozen different variations,* it has yet certain marked and outstanding features. And chiefly, as its name implies, it is a hairy plant, hairy on both sides of its leaves, particularly on the underside, downy, with thick, spreading hairs

* See Monograph “*British Violets*.” E. S. Gregory.

The Hairy Violet

on its stems, and fringed with hairs on its leaves and sepals. Secondly, it is a great chalk lover—a “calciphilous plant”—and rarely found off limestone pastures and chalky downs. It is particularly abundant where the soil is rich as well as chalky. The leaves are triangular rather than the typical Violet heart-shape, and elongate as spring passes into summer, their long stems raising them in tufts well above the ground. Two small green stipules mark the base of each stalk. None of the creeping runners characteristic of the Sweet Violet are thrown off by this plant.

The flowers are gay for Violets, mauve, with a tendency to redness, and sometimes white at the base. Unfortunately they have no scent, so this particular Violet loses the crown of Violet charm. Their structure and mechanism, of a highly specialised and interesting nature, is on the same plan as that already described in the Dog Violet (Vol. I.). As the flower hangs in a drooping position we can see five green sepals with five upstanding ears that form

Wild Flowers as They Grow

an efficient barricade to insects round the highway of the stem. The petals are five, too, the odd big one running back as a large hollow spur that pushes out and up between the two back sepals. The two side petals form lateral walls ; the two top petals are curved back sharply. The five small and very quaint stamens stand on no stalks to speak of, their five heads close together. Between the two cream pollen boxes of each is a bright orange flap which also projects beyond their tops, and clasps the ovary column just below the stigma, thus a closed conical chamber is formed by the anthers. The two stamens that are just above the big spurred petal carry little green honey-tails which are comfortably housed within the spur. The seed-case is an oval chamber containing about thirty seeds ; its column has a kink in it just where it rests on the seed-case, and it ends in a hook.

Many bees and butterflies visit the Violets during their six to eight days' life. Sometimes the big humble bee comes in burglar form, and,

The Hairy Violet

biting into the honey reservoir of the spur from outside, drinks up the honey. Hive bees come too, and attempt to act straightforwardly, but their proboscides are rather too short for this flower so, like a boy mounting a man's bicycle, though they "work" it all right, yet they do it awkwardly and slowly. But the bee *Anthophora*, so active in the spring time, is the Violet's ideal visitor, its proboscis is four times the length of that of the hive bee and "it hovers over the flower with proboscis half extended, just alighting and grasping the edges of the anterior petal with its forelegs; in this position it can probe the base of the spur with its long slender proboscis with the greatest accuracy, and it may be timed passing from flower to flower, and taking less than a second to examine a blossom, though it stays longer where honey is abundant. It is evidently this class of medium-sized insect with long proboscis which is correlated with the evolution of the special mechanism of the Violet flower." (F. A. H. Church.)

Wild Flowers as They Grow

As it alights it knocks gently against the stigma hook, rubbing pollen off its own head on to it. A drop of moisture promptly exudes, moistening the insect's head. Meanwhile the kink in the column "gives," and the anther cone chamber—really a delicate powdering-box—opens and covers the damp head of the insect with pollen powder. And so the "give and take" has been performed and the flower cross-fertilised so far as external agency can do it.

But here apparently comes failure, for the pretty flowers rarely produce good seed. This function is left to flower buds which have no attractive petals, which never open, and within whose dark recesses self-fertilisation secretly takes place. Their green seed-capsules dry and shrivel, and then split into three parts, opening to form a three-rayed star, in each ray of which is a double row of little black seeds. One by one they are pinched out with force as the shrivelling continues, and one by one they seek to establish themselves around their parent.

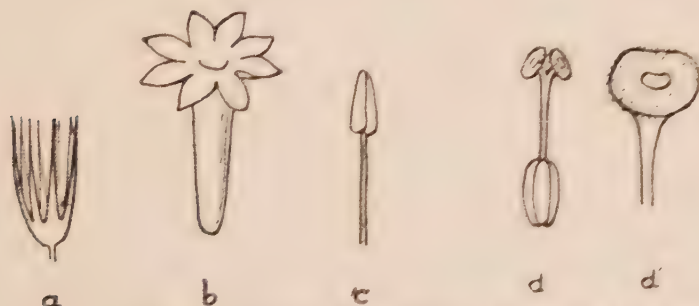
THE YELLOW WORT

*CHLORA PERFOLIATA, OR BLACKSTONIA
PERFOLIATA*

A CHALKY cliff, a sunny day, and the heyday
of summer, and then

“Pale Chlora shalt thou find”

among the “Idle Flowers” of which our poet



a, calyx. *b*, corolla. *c*, stamen. *d*, seed-case, style, stigma. *d'*, stigma,
enlarged.

laureate sings. Chalk it will have—rarely indeed
can it be coaxed off it, the dryness of the chalk,
the strong solution of bicarbonate of lime in the

Wild Flowers as They Grow

water of the soil that chalk implies, this is its first condition of existence ; and sunshine is its second demand if its yellow stars are to show in their full beauty. As the old herbalist rightly said, though in a somewhat different sense, "it is under the government of the Sun." Even in midsummer it waits to open till the sun is well up in the heavens, say nine or ten o'clock, and goes to bed at about four in the afternoon, long before the sun sets.

A quaint prim plant that one never forgets if one has once made its acquaintance, its vividly green stiff stems, rising from a tuft of leaves on the ground, carry at regular intervals most curious leaf-structures. Once, no doubt, these were pairs of stalkless heart-shaped leaves, but apparently in the course of evolution the bases of each pair coalesced, and the two leaves completely ran into each other, as it were, and formed a flat circular collar, up through the middle of which the stalk passes. Therefore it is often called the "Perfoliate Chlora," *Chlora perfoliata*. The texture of



YELLOW WORT

The Yellow Wort

both leaves and stems is particularly smooth, glaucous in fact, and the leaf-collars show the smallest possible trace of veining in their pale, often bluish-green, surface.

After passing through the top pair of leaves the stem ends in a single flower ; this is the senior flower and opens first. But springing on either side from the point where the leaf collar arises is a pair of branches, each of which ends in a single flower ; these open secondly and together. On these branches again a pair of smaller branches arises, each also ending in a flower, which four are mature together, and follow third in the sequence of flowering, and so on, and thus one gets a group of seven or more flowers in a cluster at the top of each main stem, a golden summit, at the height of anything up to a foot and a half above the ground.

The flowers are distinctly attractive ; they have each a calyx built up of eight long narrow, fine-pointed sepals, and a corolla of lovely golden-yellow petals that are joined in a very short tube below

Wild Flowers as They Grow

but are free as eight long lobes above. In the bud these are twisted. Set on the petals are eight stamens, of which four come to maturity first and discharge their pollen, and then the four alternate ones come forward and do the same. In the centre is a green seed-case with a suggestion of four lobes, and on it a thickish column which forks, and each branch carries the really notable feature of the flower, a stigma. Now each stigma is a complete circle, a thick disk, covered with short yellow hairs. This disk is set upright on the end of the style branch, and if one hold the whole structure up to the light one can see right through the two holes in the two stigmas, just as if one were peeping through double windows ; certainly a very curious structure. There is no honey, no scent, in the flower ; it is self-centred, quite independent, which has perhaps something to do with its comparative rarity. The pollen from its own stamens is received on to the adjacent upright stigma disk, and every flower thus fertilises

The Yellow Wort

itself. When the blossoms fade, and the golden petals turn orange, and the stamens wither away, this wonderful stigma structure still persists, though shrivelled in outline, and with windows no longer apparent.

The fruit is just a dry capsule carrying many seeds.

All through the plant bitter juices run, and so, as Gerard says "to be briefe, it cleanseth, scoureth and maketh thine humours that are thicke, and doth effectually performe whatsoever biting things can." The powder of the leaves, the taste disguised in anise or caraway seeds, was a medicine once largely used by physicians. Dr. Lister in 1669 sent as a present to Ray, the eminent surgeon, pastilles or small cakes of the juices of this plant as a new drug.

The Yellow Wort belongs to the Gentian family and is allied, therefore, not only to the Gentians, but to the common erythræa and the buckbean, but it stands in a little group, *Chlora*, all by itself.

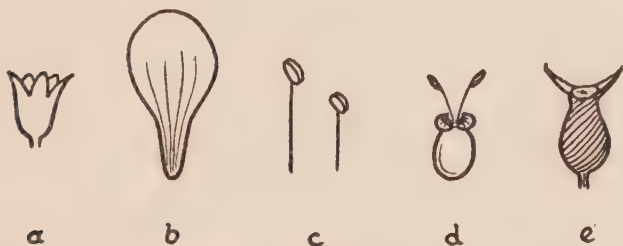
Wild Flowers as They Grow

It is sometimes known as the "Yellow Censory." The word *Chlora* comes from the Greek and signifies yellow. Old black-letter herbals call the plant the "Greater" or "More Centory." Says Askham in his "Lytel Herball," "It is named the More Centory or Earth Gall; his flowres be yelowre in the croppe." Anne Pratt states that at one time it was called "Blackstonia," after a Dr. Blackstone, a London surgeon. The country name "sanctuary" is merely a phonetic rendering of "Centory."

THE MEADOW SAXIFRAGE

SAXIFRAGA GRANULATA

SA X I F R A G E—the “Stone-breaker,” or
“Breakstone,” (Lat. *Saxum* = a rock, *frango*
= I break). The name has been given, say some,



a, sepals. *b*, petal. *c*, stamens. *d*, seed-case, styles and stigmas. *e*, fruit.

to the Saxifrage group because the plants composing it break up the rocks among which they grow. And, of course, this fact may have been the reason for the ancient medical writers and their disciples, the old herbalists, attaching to them the supposed virtues of breaking up and elimin-

Wild Flowers as They Grow

ating stone in the bladder and kidney, but in the case of this particular plant, the Meadow Saxifrage, it is more likely that it was the herbalists' favourite doctrine of signatures that led them to see in the little grains, or nodules, that characterise its roots the cryptic sign that it was a remedy of this description. Anyway, from earliest days the common Meadow Saxifrage had been reckoned the best of medicinal "stone-breakers," until the cold light of present-day pharmacy dispelled that illusion—with many others.

The Meadow Saxifrage is a moderately common plant in certain parts of England, but lacking in other parts. It likes best meadow land of damp and heavy soil, and at one time seems to have been at home near the City of London in places that read very quaintly to us nowadays. For instance, Johnson's Gerard (1636) speaks of it as "especially in a field on the left hand of the highway as you goe from the place of execution called Saint Thomas Waterings into Dedford by London," "also in the



MEADOW SAXIFRAGE

The Meadow Saxifrage

great field by Islington called the Mantles," and "in Saint Georges fields behinde Southwarke." A few years later another writer speaks of it as "on the backe side of Grayes Inne, where Mr. Lambes conduit head standeth," though by the middle of that century it seems to have disappeared from the latter place, as Culpepper only says "It used to grow near Lamb's Conduit."

It is a simple plant, half a foot to a foot high, with roundish leaves and white, good-sized flowers in groups of twos and threes. It comes up year after year from clusters of tiny bulbs or grains as big as pepper corns that lie just below the ground, from which clusters the root fibres spring. In olden days these grains were dried and sold as "Semen Saxifraga" or "Saxifrage seed" and used as a medicine. The lower leaves are lobed, the upper ones much smaller and often with plain margins, and all are fitted up with curious structures known as "hydathodes," which enable the plant to deal with the extreme moisture of its environment.

Wild Flowers as They Grow

The structure and growth of a plant is maintained by food material being carried up from the roots and through its organs by means of a current of water. Eventually the surplus water is got rid of in the form of vapour through little mouths—"stomata"—in the leaves, which mouths can open or close according as there is water to be got rid of or not. But in plants like the Meadow Saxifrage this provision is not sufficient; the surroundings are so moist that evaporation cannot take place, or only to a very slight extent, so they must perforce get rid of their superfluous water in liquid form, and hence they provide "hydathodes" on their leaves, i.e. water-ways which are always open and at the mouth of which drops of water can often be seen lying. And, since in this Saxifrage the issuing water contains a good deal of chalk, eventually little white deposits of this substance are left lying all over the leaves, and this has led to the hydathodes being sometimes called "chalk glands," which, of course, they are not in any sense.

The Meadow Saxifrage

The white flowers stand out daintily against the green meadow, their ring of five regular petals gleaming in the sunshine. The green calyx clasps the petals closely round their base so that they form a tube at the bottom of which lies the honey, thus carefully protected from any watering down of its sweetness on rainy days. The petals open almost before the essential organs of the flowers are ready to fulfil their functions, but two of the stamens rapidly and literally rise to the occasion, for they elongate, and holding their anthers in the very centre of the flower open them. As soon as they have shed their pollen they lean somewhat outward and out of the way, while two or three more stamens take their place and act similarly. During the first three days of the flower's life all ten stamens ultimately fulfil their office, sprinkling with pollen the flies, both blow and hover, which come. The stamens all safely emptied, the two columns from the ovary, as yet pressed together, grow until their tips are precisely where the anthers

Wild Flowers as They Grow

previously stood. They then diverge, and when fresh fly visitors arrive, pollen-dusty from one- or two-day old flowers, they receive the baptism of pollen that is necessary for the fertilisation of their unripe seeds. Occasionally short-tongued bees are found on the Saxifrage's visiting list.

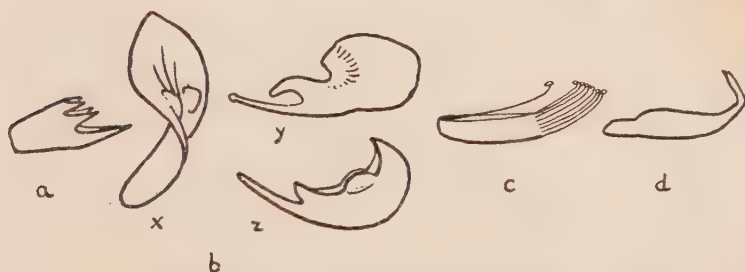
The fruit is a simple upright capsule which sways about on the head of the flower-stalk. It opens on the top, and the seeds are swung out by degrees.

The Meadow Saxifrage is found in the spring and earlier part of the summer. It belongs to the distinguished family of the *Saxifragaceæ*, which includes the hydrangea, the syringa (mock orange or philadelphus), the deutzia, and the escallonia, as well as all the Saxifrages, and that ever most charming, but somewhat elusive, British plant, the grass of Parnassus. In the genus Saxifrage itself there are no fewer than thirteen British species, of which the common London Pride is by far the most familiar. The other species, with the exception of the Meadow Saxifrage, are all more or less rare.

THE MEADOW VETCHLING

LATHYRUS PRATENSIS

THE Meadow Vetchling, despite its name, is a Pea, not a true Vetch, that is to say it belongs to the genus *Lathyrus* (Pea), and not



a, calyx. *b*, petals (*x*, standard; *y*, wing; *z*, keel). *c*, stamens.
d, seed-case, style, stigma.

to the genus *Vicia* (Vetch) in the great family of the *Leguminosæ*. It must be confessed that the distinction between the two genera is not at all strongly marked, and appeals more to botanists than to the ordinary flower lover, still one may note that in the Pea genus the ovary column, or

Wild Flowers as They Grow

style, is flattened and smooth on the outer side, though downy on the *inner* face, while in the Vetch genus this column is rounded or slightly angular and downy either all round or on the *outer* face. Again, in the Pea the long stamen tube, which is two-thirds of the whole length of the stamens, divides quite abruptly into its nine branches, in the Vetches, on the other hand, this branching begins lower, and is more gradual. These differences seem minute, but the general appearance of the two groups is rather more distinctive than the bases of division would seem to imply.

The Peas are a particularly attractive group of plants, of which the Meadow Vetchling is an excellent representative. It has gay, bright yellow clusters of flowers, eight or nine in a cluster, of the familiar butterfly or papillionaceous type, and a plentiful quantity of small, narrow foliage. And when one comes to look into the matter one finds that this foliage is of an unusually interesting nature, and with a good deal of variety about it. It is really



MEADOW VETCHLING

The Meadow Vetchling

built up of a number of compound structures, each of which consists of four parts, to wit, a pair of narrow leaflets, a terminal tendril branched and curled, a fine stalk carrying the leaflets and tendril, and at the base of the stalk a pair of leaf-like structures or stipules. But these stipules, though quite as big as the leaves, are of a totally different shape. Instead of being narrow and oblong they are "sagittate," or arrow-head shape and, stalkless, are produced back where they join the stem into two long pointed tails, one longer than the other, which clasp the main angular stem. And these four structures, leaflets, tendril, stalk, and stipules, together represent a perfect leaf. Now the majority of leaves possess no stipules, the oak, the violet, the holly, for instance, have none, but where they do possess them, as in the rose, the stipules are usually very small affairs that require looking for, rarely indeed are they the size of the leaflets themselves as in this case. As for the tendrils these each take the place of a terminal

Wild Flowers as They Grow

leaflet, and have been evolved as a counterpoise to the weakly trailing of the stems, for they grip adjacent plants of all sorts and so raise the Vetchling itself and give it due place among the crowded vegetation of the meadow and hedgeroad. Without these tendrils the plant would be suffocated and quickly done to death. But this vigorous elevation of itself at the expense of others has led the country folk to call it with some impatience the "Ramping Wild Vetch," because as Parkinson (1629) said "It is the most pernicious herbe that can grow on earth, killing and strangling corne or any other good herbe it shall go by."

The gay yellow flowers, too, are each pieces of subtly contrived and elaborate mechanism which can only be really understood if the flower is between one's fingers and under close scrutiny while the explanation is being followed. Take a flower then, and note that the calyx is a cup with five extremely sharp points. The yellow corolla fits into the horizontal calyx with a long tube; beyond, it

The Meadow Vetchling

expands into a structure of four parts. First a large, broad petal, the standard, whose farther part, on which run half a dozen black lines, is thrown up to stand erect. Just where the petal turns upwards there arise on its surface two projecting little walls, one on either side, distinctly marking the entrance into the corolla tube. Remove this "standard" and then the rest of the flower is rather like a pipe in outline. Two small yellow side petals clasp a keel-like structure, and are not easy to detach, because they are definitely hooked on to the "keel." A gentle tug and the hooks give way, and the side petals, if set out singly on a sheet of paper, are seen to be quite complicated structures. There is a thin stalk-like base, a large hook where the petal widens a little, and then, just where it spreads into a wing, there is a pleating obviously also intended to fit into pleats elsewhere. And now only the whitish, almost transparent keel formed by the union of the two lowest petals remains to be examined. Careful

Wild Flowers as They Grow

scrutiny shows that there is a hook on each side to slip into the hook on each side petal, and a pleating that also just fits into the pleating of the side petal, and thus we see why the centre of the flower is so well gripped together.

Inside the keel a green structure fits closely. Along the base it runs as a long green tube—the united filaments of nine stamens—then just where the keel rounds upwards it divides into nine short filaments carrying little brown anthers. There are really ten stamens, but the top one of all is quite loose so that there is a gap left along the whole length. Through this the insects can thrust their proboscides when they seek to lick the honey that oozes from the lining of the tube. Inside the stamen tube is a miniature pod ending in a long fine point that follows the outline of the keel as the stamens did, and below this point is a ring of fine hairs forming a brush. When the anthers are mature they open, and the pollen formed on them falls out and collects in the top corner of

The Meadow Vetchling

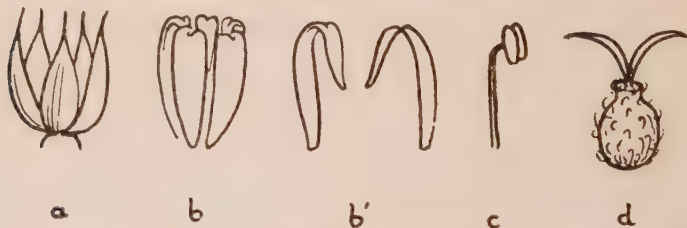
the keel. If now a bee, for instance, straddles on the keel, down go the interlocked keel and wings together, under its weight ; out shoots this fine point on to the insect's pollen-dusty body, getting dusty itself, to be followed instantly by a little cloud of fresh pollen swept out by the brush on to the visitor. The bee flies away, keel and wings spring back into position, fertilisation has been effected, and fresh fertilising pollen sent on by the bee messenger to some adjacent blossom. The resulting fruit is a smooth green pod containing several seeds.

The Meadow Vetchling is in flower from May onwards during the whole summer. Though abundant throughout the land and bright and showy, it seems to have made no sentimental appeal to the affections of the countryside, and is, apparently, enshrined in no legends or traditions.

THE SEA HOLLY

ERYNGIUM MARITIMUM

GREY stems, grey-blue prickly leaves, blue thistle-like heads topping the stalks, the Sea Holly rises like small islands out of the shifting sandy sea of the yellow sands hills.



a, sepals. *b*, corolla. *b'*, single petals. *c*, stamen. *d*, seed-case, styles.

“The Eryngo here
Sits as a queen among the scanty tribes
Of vegetable race. Around her neck
A gorgeous ruff of leaves, with arrow points,
Avert all harsh intrusion. On her brow
She binds a crown of amethystine hue,
Bristling with spicula, thick interwove
With clustering florets, whose light anthers dance



SEA HOLLY

The Sea Holly

In the fresh breeze, like tiny topaz gems.
Here the sweet Rose would die. But she imbibes
From arid sands and salt sea dewdrops, strength;
The native of the beach, by Nature formed
To dwell among the ruder elements."

(DR. DRUMMOND.)

Together with the marram grass, the sea purslane, and the yellow horned poppy, it wrests a bare subsistence out of the poor, grudging sand. It is one of the first plants that appear as a sand flora forms, and it is a marvel how it can make so brave a show out of such unpromising materials. In appearance the plant is a curious cross between a piece of holly as regards the leaves, and a thistle as regards the flowers. The very leathery leaves are coursed by prominent veins, and they put up a most excellent holly-like defence by their margins rising into long sharp spines. The hard leatheriness is a special provision of Nature to ensure the smallest possible amount of evaporation, for the sand is very porous, and water runs away at once—it is rather a case of "Water, water everywhere,

Wild Flowers as They Grow

and not a drop to drink"—and though the roots are very long, and travel far, yet what little water they can get must be husbanded to the uttermost. Moreover, as that water is often highly impregnated with salt, the plant absorbs as little as possible with a view to reducing the acquisition of salt. Unlike the holly, however, the leaves fall in the winter; even they cannot face cold in addition to their other hardships.

By the way, the roots were once greatly favoured as a sweetmeat. Falstaff speaks of "Kissing comfits and snow eringoes," and "The Manner to condite (i.e. to preserve) eringoes" is thus set forth in an old book of Queen Elizabeth's reign, and is here given to inspire amateur sweet-makers of the present day.

"Sugar . . . take a pound of it, the white of an egge, and a pinte of cleer water . . . let it boile until it be come to good strong syrrup, and when it is boiled, as it cooleth adde thereto a saucer full of rose water, a spoone full of Cinnamon water,

The Sea Holly

and a grain of muske, which have been infused together the night before, and now strained : into which syrrup, being more than halfe cold, put in your roots to soke and infuse untill the next day : your roots being ordered in manner hereafter following : These your roots being washed and picked, must be boiled in faire water by the space of foure houres til they be soft : then must they be pilled clean as ye pil parsneps, and the pith must be drawn out . . . let them remain in the syrrup till the next day, and then set them on the fire in a faire broad pan untill they be very hot, but let them not boile at all : let them remain over the fire an houre or more, remooving them easily in the pan from one place to another with a wooden slice : This done, have in a readinesse great cap or royall papers, whereupon strow some sugar, upon which lay your roots, having taken them out of the pan. These papers you must put in a stove or hot house to harden, but if you have not such a place, lay them before a good fire : in this maner

Wild Flowers as They Grow

if you condite your roots, there is not any that can prescribe you a better way."

An even older book tells us that "The roote preserved and comfited is good for old folkes and others that are wasted and withered."

In other ways, too, the plant served the culinary art. "The young leaves may be boyled and with salt and oyle preserved for sallads," says Langham (1579) in his "Garden of Health," but he adds the warning, "The herbe with the roote must be gathered when the Sunne is in Cancer." The young flower-shoots boiled and eaten like asparagus, are said to be good and nourishing.

The flower heads, though thistle-like, are not really of the thistle type at all, but akin, little as they look it, to the hedge parsley, the hemlock, and the wild carrot, and all that multifarious group of the *Umbelliferae*, whose flat white heads of flowers are in every hedgeside. In this case the flowers are not actually brought up to the same level, but are crowded together, stalkless, into the blue

The Sea Holly

heads which are surrounded by half a dozen bracts like miniature leaves.

Break up one of the globular flower heads into its constituent parts ; it is composed of a number of flowers, each flower having beneath it a three-pointed blue bract. The stiff points are part of the plant's scheme of defence, the blueness part of its scheme of attraction, for it gives additional colour to the head. The individual flowers are small, but their structure has one or two curious features. The calyx of five sepals is placed on the ovary, the blue corolla would naturally be a tube ending in five long lobes, but the lobes are not apparent at first sight, for they are turned right down inside the tube, as the diagram shows, and together almost cover up the very centre of the flower. Five stamens alternate with them, and their heads fill up the gaps. The seed-case is below the petals and stamens, but it is crowned with a ten-rayed honey disk that forms the floor of the flower, through the centre of which rise two styles, at first very

Wild Flowers as They Grow

short. It is chiefly to protect this disk against small flies and moisture that the incurving of the petals is designed. Any insect whose proboscis is not less than 3 mm. or 4 mm.—i.e. any middle-sized or large insect—has sufficient power to push the petal guard aside and suck the nectar. In sucking it gets dusted at its hinder part with the pollen, for in the first stage of the flower's life the stamens project as far beyond the corolla as the nectar lies below it. At this time the flower may be said to be wholly male. As the flower's life goes on the stamens wither and the anthers fall off, but the styles grow, and soon they extend beyond the corolla as much as the stamens did in the previous stage. Therefore the flower is now potentially female only, and an insect visiting rubs the hinder part of its body upon stigmas instead of upon stamens, and thus pollen acquired from a younger flower is transferred to this particular flower. Hence there is cross-fertilisation; apparently no self-fertilisation is catered for.

The Sea Holly

On the little oval fruits that form the sharp pointed calyx teeth are retained.

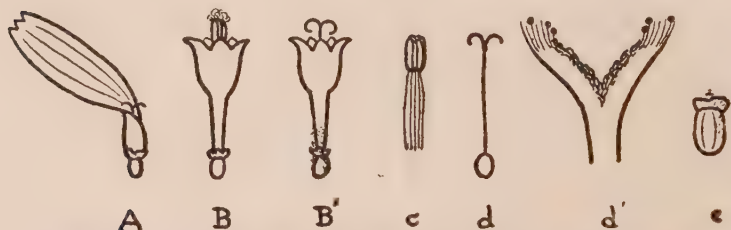
There is a superstition dating from Grecian times that Eryngo flowers, if worn by brides, would ensure the lasting love of their husbands. By their aid Sappho attempted to charm Phaon, the young and handsome boatman of Mitylene, but, unsuccessful, she is said to have thrown herself into the sea.

The Sea Holly is found at its best on the East coast of England and Scotland in July and August. It has a rare relative, the Field Eryngo (*E. campestre*), which has been discovered in one or two places in England.

THE YELLOW CHAMOMILE

ANTHEMIS TINCTORIA

THE flora of our country is made up very much as is the nation itself. The mass of its members are natives, individuals indigenous to the soil, who from time immemorial have pos-



A, ray floret. B, disk floret (first stage). B', disk floret (second stage).
c, stamens. d, seed-case, style, stigma. d', stigma, greatly enlarged,
showing terminal "brushes" with pollen grains thereon. e, fruit.

sessed the land. Associated with them is a large class of those who are not of true native stock, but who have so long made the country their home, and have found their surroundings so congenial, that they have become nationalised and fully



YELLOW CHAMOMILE

The Yellow Chamomile

established, and now are on equal footing with the natives, indeed, it is difficult to conceive of some of them as not being truly indigenous. But yet a further group must be taken account of in summing up the inhabitants of a country, and that is all those aliens who dwell *in* the land but are not really *of* it. They may have been born there, they may have descendants there, but they have never become nationalised, never really established they are never quite at home. Thus among the natives of our land described in our present volume, must be ranked the thistles, the sea holly, the violet, and the orchids; among the nationalised immigrants the shepherd's purse and the black nightshade, while the Yellow Chamomile, the subject of this picture and description, is a typical example of the alien class. For it is a casual, pure and simple, cropping up now here, now there, at one time flourishing on a ballast heap where a ship-load of French or Danish earth has been discharged from some tramp steamer, at another time adorning

Wild Flowers as They Grow

a stony waste, an escape most probably from some garden in the vicinity. But inasmuch as it is growing wild, untended, unsown by man, room must needs be found for it in a list of the wild flowers of our land.

It seems a pity that having once gained a foothold it cannot make headway here—for it is a gay, handsome plant; and strange, too, for in Britain it has a climate very similar to that of Eastern France and Denmark, in both of which countries it flourishes wild in abundance. But the fact remains that though it appears again and again it does not increase in numbers, so different is it in this respect from the little *Claytonia* (Vol. VI.), or the brilliant *mimulus* (Vol. III.), both of which are now well established, though even of more recent introduction.

A little bush, perhaps one or two feet high, it has much-branched stalks covered with white hairs, and leaves that, though green above are white with down on their under-surface. It is a

The Yellow Chamomile

special point for notice that these leaves are greatly divided up, being cut into fine segments, which are again deeply toothed. Were it not for this dissection the plant might possibly be sometimes mistaken for the corn marigold (*Chrysanthemum segetum*), which in certain districts gives such brilliancy to the cornfields, but the fact that the leaves of the corn marigold are plain and undivided, their margins merely being a little toothed, is a ready method of distinction. For the blooms of both plants are a bright yellow, yellow rayed, yellow centred, and built on the same plan, the plan of the ox-eye daisy, the scheme in general of the *Compositæ* family, to which our plant belongs. In this family the end of the stalk becomes broadened out into a "receptacle," on which a large number of little individual flowers are set in concentric rings, the whole being enclosed in an involucre, or circle of green bracts. In the Yellow Chamomile there may be some five hundred of these flowers set upon a single receptacle. Note particularly—it is

Wild Flowers as They Grow

a distinguishing mark of the genus *Anthemis*—that a little chaffy scale is placed between each flower. In the corn marigold, of the genus *Chrysanthemum*, there is no such scale. The outermost ring is different from all the other rings, for it is composed of ray florets, thirty to thirty-five altogether. Here the corolla of each, tubular below, is strap-shaped above, forming the outward-stretching yellow ray. No stamens lie within the petal-tube, but a forked stigma can be seen just peeping out of it, and a style column connects the stigma with the seed-case down below the base of the corolla. Therefore in the ray florets the female element alone is represented.

In the three hundred to five hundred disk florets the corolla is wholly tubular, being a straight, narrow tube below, and an inverted, five-toothed bell above, the whole in outline rather like an urn on a straight pedestal. The seed-case again forms the base on which the corolla stands. Five stamens are within it, their five heads joined

The Yellow Chamomile

into a hollow cylinder which protrudes a little beyond the bell; their five filaments are all distinct. A style and stigma rise in the centre. The stigma in the earliest part of the flower's life has its two branches closely pressed together, in line with the style, and their tips are furnished with a brush of hairs. The little flowers are rich in honey and the sweet liquid rises right up into the bell, laving both filaments and style. At first the stigma brush only reaches up to the lowest part of the anther cylinder, but, just as the anthers open and pour their pollen into the chamber, the style grows and slowly sweeps before it all this pollen, the anther cylinder doing its share of this clearing-out process by retracting a little into the bell. When the pollen emerges into the open it lies free in a little pile ready for immediate dispersal. After this has happened the style opens its branches, curling backwards and revealing their inner receptive surface covered with minute papillæ. This sequence of events is carried on successively in all

Wild Flowers as They Grow

the rings of florets, each ring acting in concert and the development passing regularly and slowly inwards to the centre of the bloom until all have been brought into action.

But all this time the receptacle itself is changing its form in a remarkable and very characteristic way. At first almost flat it is gradually "humping up" in the middle, becoming first a hemisphere and then a cone, with the result that the flowers on its side which were once erect are now tending to the horizontal position, and this tilting up exactly corresponds in time with the maturing of the successive rings of flowers. Hence just as one ring of the florets is opening its styler branches to receive pollen the younger row within is so nearly horizontal that the pollen heap, as it is pushed out by the stigma brush, tips over on to the floret immediately below in the older ring. Thus during the whole life of the bloom there is a continuous falling over of pollen from the stamens of the florets of one ring on to the styles of the

The Yellow Chamomile

florets in the ring immediately outside it. Of course this fertilisation within the confines of a single bloom is only cross-fertilisation to a limited extent, but inasmuch as the blossom is visited by many insects for its honey and pollen—thirty-five different kinds have been noted—and particularly by a certain fly, *Ulidia erythrophthalmia*, which comes in hundreds to it, cross-fertilisation from bloom to bloom and plant to plant is occasionally brought about. As the nectar rises so high in the bell insects with the shortest of proboscides are attracted.

At nightfall the Yellow Chamomile droops its rays, acting therefore in contrary fashion to the daisy, which arches its rays protectingly over the disk florets. No doubt this action of the Yellow Chamomile minimises to some extent the effect of cold and damp, but, of course, it is no protection to the tiny flowers upon the disk.

The florets give place to dry little fruits—achenes—which have a small scaly crown, not of much service as a wind catcher, but possibly

Wild Flowers as They Grow

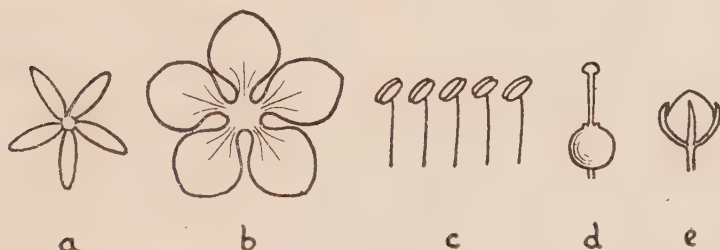
better than nothing. At one time this plant had a great reputation with dyers, for it gives a particularly clear and good yellow dye. Hence its specific name *tinctoria* (*tinctoria* signifying anything dyed). But almost all vegetable dyes have sunk more or less into oblivion since aniline dyes were discovered.

Four kinds of Chamomile find place in the official flora of our land; the Fetid Chamomile, often less euphoniously termed Stink Mayweed (*Anthemis cotula*), the Corn Chamomile (*A. arvensis*), the Common Chamomile (*A. nobilis*), (Vol. IV.) and the Yellow Chamomile (*A. tinctoria*). The first three all have blooms with white rays and yellow centres—commonly called white “flowers”—only the last-named has yellow rays round a yellow centre.

THE WOOD LOOSESTRIFE

LYSIMACHIA NEMORUM

THE Wood Loosestrife is one of those individuals of neutral personality whose salient points all seem borrowed from their neighbours.



a, sepals. *b*, corolla. *c*, stamens. *d*, seed-case, style, stigma. *e*, fruit clasped by sepals.

Pretty enough as it trails on some bank by the edge of a wood, or creeps, half hidden, in the moist shade of the trees, there is yet nothing original or striking about it—except its strong resemblance to other plants. The first sight of its golden flowers is apt to cause a novice to exclaim

Wild Flowers as They Grow

“a yellow pimpernel,” which it is not, though, indeed, it is often called the “Yellow Pimpernel,” so exactly do its blossoms recall, in all but colour, the scarlet pimpernel, or “poor man’s weather-glass,” of every wayside. And next, as the trailing stems are raised, another close similarity flashes into mind, for they might be almost those of the ever-familiar creeping jenny, the “herb twopence.” Here, too, the leaves are ovate and shining and lie in pairs, one behind the other, all facing the sky, so that a row of leaves on short stalks of even length flanks either side of the main stem. There is, however, some reason for these resemblances, for all three plants are members of the same family, the *Primulaceæ*, but whereas the Wood Loosestrife and the creeping jenny are sisters—members of the same household, so to speak, the genus *Lysimachia*—the scarlet pimpernel is but a cousin, a member of a different household, the genus *Anagallis*.

Of course there are differences to chronicle; the stems of the Wood Loosestrife never reach



WOOD LOOSESTRIFE

The Wood Loosestrife

the length of, nor are quite so closely attached to the ground as are those of the creeping jenny, which tend to root at any node, and the leaves are a more elongated oval than are the green "pennies" of that plant. As to the bright little flowers, the calyx consists of five very slender pointed sepals, mere radiating green lines, and the corolla of five much broader, egg-yellow petals, the lines of whose bases curve in to form almost a tiny stalk to each before they unite into a common centre. The spaces between the "stalks" being backed by the sepals suggest a green star at the centre of each flower (*see* the diagram at the head of the chapter).

Opposite the petals, not alternating with them as is the general rule, are five stamens with anthers that are so lightly attached at their extremities that as they open they tend to get out of line with the filaments, and each stamen looks like a little flaming torch. At first they are more or less erect, but before they open their anthers they stretch widely outwards from the seed-case and its

Wild Flowers as They Grow

column, so that none of their pollen can fall by any inadvertence on to the stigma top of that column. Since they do not mature until later than the stigma there is time, when the bud opens, for them to perform this movement before their pollen is exposed. The style column is shorter than the stamens would be, were they erect, so some precaution is necessary to keep pollen and stigma apart.

The Wood Loosestrife's flower contains no honey, and it seems to have no special attraction for insects. The few that do visit it are chiefly pollen-devouring hover-flies. However, it is quite independent of the insect world, for before the flower fades the stamens slowly raise themselves and stand over the stigma, pressing upon it the remnants of their pollen, which is amply sufficient for fertilisation purposes.

The fruit is a round green ball—or capsule—clasped by the five narrow calyx segments, and containing a number of seeds which are ranged

The Wood Loosestrife

round a central column, a somewhat uncommon arrangement of seeds in a seed-case, though usual in the family *Primulaceæ*. When it is ripe and dry five splits appear at the top, meanwhile the stalk has curled over, so that now the capsule is held top downwards and the seeds can fall out. No doubt a little swaying of the wind helps a trifle to spread them over a somewhat greater area than would naturally be the case. It must be noted that each flower arises in the upper angle between a leaf and the main stem on a stalk that is rather longer than that of a leaf.

It is not to be wondered at that so unobtrusive and neutral an individual is not to be found sung by the poets or eulogised by the herbalists. The latter indeed class it with the scarlet pimpernel, but their prescriptions and remarks refer to the common pimpernel, and none other. It has, in fact, made no mark of its own in the lore of the floral world. Its very name, Loosestrife, so full of allusion in referring to the Common Loosestrife

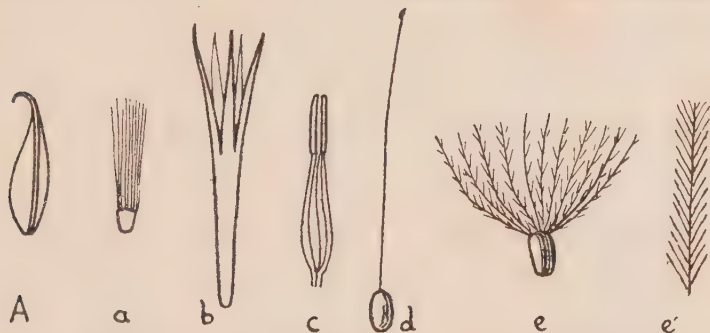
Wild Flowers as They Grow

(Vol. II.) is only given to it because of its relationship to the greater plant, and no one suggests that King Lysimachus, who gave his name to the genus as a whole, had any connection with this humble member of it. Its specific name *nemorum* "of the woods," alone gives a true personal touch to its nomenclature, for the woods in June form the rightful setting for this little plant. However, it has one claim on our interest, it is a true Britisher, an undoubted native of our land.

THE SPEAR-PLUME THISTLE

CNICUS LANCEOLATUS

THIRTEEN kinds of plants are dignified, or opprobriated—it depends upon the point of view—with the name of Thistle in Great Britain,



A, bract. a, calyx (pappus) on seed-case. b, corolla. c, stamens. d, seed-case, style, stigma. e, fruit. e', feathery hair of pappus.

and it is none too easy for the non-botanist to distinguish between them. The Carline Thistle of our next sketch is, however, easily marked off by its shining straw-coloured halo, on account of which botanists refuse to accept it as a real Thistle ;

Wild Flowers as They Grow

so, too, do they reject the so-called Scotch, or Cotton Thistle, on the minor point that it has scales instead of long bristly hairs on the receptacle between the florets. Its leaves are covered with dense cottony down, hence its name, and its flower heads, like the typical badge of Scotland, of which country it is nevertheless not a native, look like a purple ball on top of a green one.

The eleven species of true Thistles can be at once divided by aid of a lens into two groups; those in which the silver hairs of the thistledown are quite simple—the *Carduus* group—and those in which the hairs are feather-like—the *Cnicus* or Plume Thistle group. The Spear-Plume Thistle, as its name implies, is one of this last group, and has six other Thistles with it there. Next turn to the leaves. In three of these seven species the leaves are continued backwards, like narrow green wings, down each side of the stem, in the four others they are not so continued. The Spear-Plume Thistle is one of the first three, so it now only remains



SPEAR PLUME THISTLE

The Spear-Plume Thistle

to distinguish it from the Creeping Thistle (*Cnicus arvensis*) on the one hand, and from the Marsh Thistle (*Cnicus palustris*) (see Vol. II.) on the other. And this one can do at once because its flower-heads are few, large and handsome, whereas the other two have small flowers gathered into close clusters or looser groups. There are other more fundamental differences, of course, but they are not so apparent at a casual glance, for instance, the Spear-Plume Thistle is a biennial, and all its tiny florets contain both stamens and ovary, while the Creeping Thistle is a perennial, and has either only stamens or only ovaries in its florets, that is to say one plant has entirely male flower heads, while another plant has entirely female flower heads. The Marsh Thistle is not quite so easily marked off outside the very distinctive size of the flower heads, but we may note that the bracts round each head are not nearly so prickly as in the Spear-Plume Thistle.

The Spear-Plume Thistle, now that we have at last run it down, is one of the commonest of our

Wild Flowers as They Grow

Thistles. It grows anywhere—hedgeside, waste or cultivated land. It is one of the weeds of which Tusser complained as fretting and annoying corn in Queen Elizabeth's days.

“The maywede doth burne and the thistle doth freate
The lime pulleth down both the rie and the wheate.
The dock and the brake noieth corne very much
But bodle * for barley, no weede there is such.”

(“One Hundred Points of Good Husbandrie,” 1557.)

In Robert Burns patriotism triumphed over annoyance—

“The rough burn-thistle spreading wide
Amang the bearded ear—
I turn'd the weeding heuk aside
An' spared the emblem dear!”

But it is also one of the handsomest Thistles as well as one of the commonest, though prejudice prevents most people admiring a Thistle of any description. It may stand as much as five feet high. A great plate of leaves lies at the base if the plant be fairly young and, anyway, its lower leaves are very large and immensely prickly. Great

* Corn Chrysanthemum.

The Spear-Plume Thistle

stabbing prickles are arranged at short intervals along deeply waving margins, both where those margins are on the part of the leaf that runs down either side of the stalk and where they are bordering the free outstanding part. The very word thistle, written *pistel* in Anglo-Saxon times, is derived from the Anglo-Saxon word *pydan* meaning to stab, and the prefix "Spear" emphasises, and not without cause, the determined defence that this plant has adopted. Even the bracts of the involucre round the flower-heads have long, sharpened, hard points. Not only are the leaves surrounded by a guard of horny prickles, their very surface is harsh and rough to the touch, because all over it, as a lens reveals, are standing stiff little hairs. The under-surface is covered with a whitish coat. Obviously the leaves of Thistles are planned with a view to existing in a particularly dry environment, that is to say they possess xerophilous characters; their blade surface is reduced to the utmost limit, and what there is, is thickened and hair-coated to prevent evaporation.

Wild Flowers as They Grow

The Thistle heads in early days are short, blunt cones with a spiky green coat open at the top to show deep rose contents. These contents push up and prove the heads of the florets. They are all alike, the calyx is composed of the feathery-like hairs that play so prominent a part later; the corolla is the narrowest needle-like tube, white below, with a purple, slightly swollen top, deeply cut into five thread-like lobes. Though so narrow it manages to secrete quite a supply of nectar. There are five stamens whose united heads—the anther cylinder—find sufficient space in the upper, larger part of the tube. The ovary below all is white; the column from it grows up through the anther cylinder, sweeping out the white roughened pollen grains before it by means of a pointed brush of hairs at its tip. Though the style has two branches, which in most plants of this order spread apart in their last stage, they here remain closed up, but to make up for this it is found that their margins are roughened and beset with papillæ, and to these

The Spear-Plume Thistle

the equally roughened pollen grains cling. There is no reason why self-fertilisation should not occur, for the margins remain just below the sweeping brush, and no doubt pollen grains must often fall from one to the other. The Spear-Plume Thistle, owing probably to the depth of its corolla tube, does not seem to encourage insect visitors to the extent that the Creeping Thistle does. Anyway Miller found that only twelve insects visited it to eighty-eight who visited the latter, where the corolla tube is only a quarter the depth.

When the flowers wither the involucre bracts close over them, and hide for a while the development into fruit. Then in the fullness of time they are pushed apart by the opening out of the feathery calyx hairs, and piece by piece the wind lifts the fruits and their parachutes out of the now exposed cup, and they float away, gallant aviators, to seek their fortune. And on the whole they are wonderfully successful. One reason for their success is that the wind, as a rule, only carries them to districts

Wild Flowers as They Grow

more or less in their own latitude, and hence to congenial climates; seeds that are carried by birds—especially migratory birds—are naturally carried through different latitudes, and hence to different climates and greater risks.

A piece of this plant's thistledown is a positive joy in the sunlight under a lens. The fruit is dry and brown with a flat circular top. Round this top are ranged some thirty to forty shining hairs and each hair has many fine lateral branches, and all gleam in the sunshine like burnished silver.

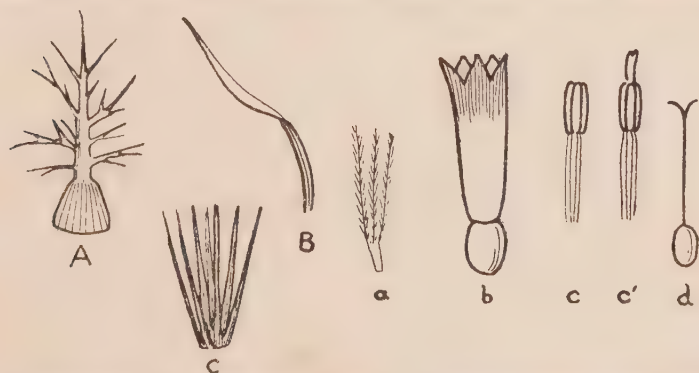
This Thistle has many names. It is known variously as the "Bow-," "Bell-," "Bird-," "Blue-," "Boar-," "Bar-," "Buck-," and "Horse-Thistle," the last two names being used to denote its large size. Sometimes it is known as "Quat-Vessel," from the shape of its flowers in bud, and, during the maturing of the fruit, sometimes as "Cheese," and sometimes as "Dashel," a corruption of Thistle.

All the thirteen Thistles belong to the *Compositæ* family.

THE CARLINE THISTLE

CARLINA VULGARIS

CHARLEMAGNE'S Thistle, the Thistle of his dream and his deliverance! for legend tells that this mighty Emperor was once near having



A, outer scale. B, shining inner scale. C, chaffy scales between florets (enlarged). a, feathery pappus (calyx). b, corolla on seed-case. c, stamens. c', stamens, stigmas protruding. d, seed-case, style, stigmas.

his fine army swept away by a horrible, overmastering pestilence. So he prayed earnestly for help, and then, as he slept, an angel appeared who

Wild Flowers as They Grow

shot an arrow from a crossbow. In the plant that the arrow pierced, there, he was told, lay the remedy. And the plant with the arrow through it was the Carline Thistle, and by it the army was cured, as the angel foretold. Therefore to this day is the Thistle called after the Emperor—Carline. And ever afterwards as long as the old herbal medicines held sway the plant was known as a plague drink, and “an enemy to all manner of poysons.” The thick root being “somewhat aromaticall,” as Parkinson said, was the part usually employed, and that was not only used for what was, to all intents and purposes, an antiseptic, but as an embrocation for “those that have been dry beaten and fallen from some high place.” * It had, too, some reputation as a toothache cure if chewed in its solid state.

Connected in this way with so celebrated a soldier-emperor one would naturally expect to find that in the opinion of the astrologers the

* Gerard.



CARLINE THISTLE

The Carline Thistle

plant ranked under the dominion of Mars, but in any case its own inherent belligerence would give it the right to be a protégé of the war god, for at every point it is armed with the sharpest of prickles ; a small plant, not a foot high as a rule, its narrow leaves are little else but midrib and prickles ; a leaf not more than an inch long will have sixty to a hundred prickle-spines ranging round its margin, some of them so severely stiffened as to be almost horny. The lower leaves have often a little cotton down upon them, the upper ones are mostly quite smooth, and their bases do not run back, joined like wings to the stalk, as so many Thistles' leaves do. No animal, not geese even, will try to get through this strong defence, and, indeed, there is nothing for which to get through, since what there is of leaves is all rigid and juiceless.

But it is the shining straw-coloured bracts bordering the flower-heads that give it its individuality, it is these which remind one of the conventional diagram of the sun and its rays, and

Wild Flowers as They Grow

it is these, too, which place the plant in the group *Carlina*, quite by itself, in the *Compositæ* family, instead of classifying it with the ordinary Thistles.

Take a flower-head in bud stage for dissection. It is wrapped in an outer coat of scales, green at the base and thickly beset with stiff reddish prickles above, in fact so much is the emphasis laid on prickliness and defence that many of the prickles have three or four branches, each as sharp as a needle. Inside this coat of armour are a number of prickleless, tall scaly bracts, reddish on the outer side, straw-coloured within; at this stage they are standing erect, and forming a pale cone that rises above the prickly bracts as an egg out of an egg cup. Inside this cone are many florets, but even if one peep within one cannot see them, as they are obscured by a quantity of fine chaffy scales that rise above them, there being a scale to every floret.

As the flower-heads develop, these inner scales open out and gradually lay themselves back into a horizontal position, and the cone stage changes

The Carline Thistle

into the sun stage. At this point the flower-head is very like those "everlastings" whose scaly persistence in all colours made them once such general favourites. Touched by the Midas finger of sunlight the straw-like rays become a golden halo, setting off the softer yellow centre of congregated florets. So these shining bracts fulfil a double purpose; they play the part of bright petals and mark out the flower-heads and render them attractive, and they also actively protect the multitude of florets that they surround by rising up and forming a hut-like covering over them whenever night falls or the weather is bad. Thus dew and rain alike run off the sloping, shining cover, and the pollen and honey in the florets below are saved from harm. At daybreak, or in fine weather, the bracts open out again, and hence the plants are frequently employed as rustic barometers. These movements are due to the fact that they are very hygroscopic; they readily absorb, and as readily give up moisture, and the difference in the tension

Wild Flowers as They Grow

of the tissues thus brought about induces the rising and falling.

The yellowish florets in the centre are of the usual Thistle pattern. The calyx is represented by a thick ring of feathery hairs, the petals are a five-toothed tube. The stamens, ovary, style, and stigma, and their mechanism for fertilisation are as described in the Spear-Plume Thistle. The fruit is very like a shuttlecock, only the feathery top is a thousandfold softer and more pliable, and the heavy base—the seed—has a silver silken coat. When the fluffy mass of fruits breaks up, each individual is set free to go on its own aerial voyage—the one voyage of discovery in its lifetime.

“ ‘ Breathe soft, ye Gales,’ the fair Carlina cries,
‘ Bear on broad wings your Votress to the skies.’

Plume over plume in long divergent lines
On whalebone ribs the fair Mechanic joins;
Inlays with eider down the silken strings,
And weaves in wide expanse Dædalian wings,
Round her bold sons the waving pennon binds,
And walks with angel-step upon the winds,”

The Carline Thistle

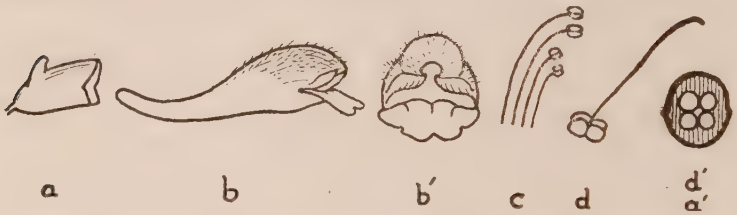
wrote Erasmus Darwin (the grandfather of Charles Darwin), 1799, in his "Loves of the Plants."

The Carline Thistle is a dweller in arid, dry wastes, hillsides, and dunes near the sea. Linnæus spoke of the sight of it as "a mournful spectacle," because it indicated such barrenness of the soil, and it is obviously built on drought-resisting lines. Nevertheless, in late summer and autumn, it touches those bare lands with real beauty, and Parkinson showed he was a true artist when he included it with the Globe Thistle (*Echinops*, not really a true Thistle), and the Friar's Crown (or Woolly Thistle, *Carduus eriophorus*), in his "Earthly Paradise," his "Garden of Chose Plants"—though he felt something of an apology was due to his readers. "You may somewhat marvell," he said, "to see me curious to plant Thistles in my garden where you might as well say they are rather plagues than pleasures . . . but when you have viewed them well which I bring in I will then abide your censure if they be not worthy of some place."

THE SKULLCAP

SCUTELLARIA GALERICULATA

ONE of the interminable labiate type of weeds that punctuate our hedgesides and shady woods, a member of a family where family likeness is more marked than individual variation,



a, calyx. *b*, corolla. *b'*, corolla (front view). *c*, stamens. *d*, nutlets, style, stigma. *d' a'*, fruit in calyx.

closely akin to the dead nettles (*see* Vols. I. and IV.), the stachys (*see* Vol. V.), the self heal (*see* Vol. V.), ground ivy (*see* Vol. VI.), and calamint, it is not surprising that the Skullcap does not stand out as a very great personality in our flora. Still, it has much more definite features than many of its



SKULLCAP

The Skullcap

relations, and once well defined in one's memory holds its place there.

Pairs of bright blue flowers, stalkless but stretching out from the stem, are set close together side by side, or perhaps one a little above the other, on the stems, all the flowers facing one way—the way of the oncoming light—and each fancifully reminiscent of a fish, say a whiting with blue head and body and tapering white tail, the large underlip standing—to a sufficiently vivid imagination—for a not too accurate fin. The smooth square stalks carrying the flowers are often reddish; the leaves, smallish, and shaped like the head of a lance, are in pairs, and the pairs of flowers always stretch out from the points where the very short leaf-stalks rise on the main stem. Indeed the Skullcap with its pairs of bright blue flowers contrasting with the pairs of bright green leaves is one of the most attractive members of the whole *Labiatae* family.

The calyx of the flower gives the plant both

Wild Flowers as They Grow

its names. It is divided into two plain lips, one above, one below, and on the back of the upper lip is a curious little hollow hump, and if one hold the flower mouth downwards it has the appearance of a helmet, such as men wore in jousts of old, the visor being up at this stage. This resemblance, much emphasised later in the fruiting stage of the flower, gives the specific name, *galericulata*, from *galea*=helmet. But if one hold the calyx the other way up it looks rather like a dish with a handle—this is the aspect from which Linnæus viewed the flower when fixing its generic name, and hence he called it *Scutellaria*, from *scutella*, a little dish, or, more strictly, a salver. A calyx is so often insignificant and featureless that it is interesting to find a flower in which it presents marked points of interest. It also plays a definite part later in the dispersal of the seeds.

The blue corolla is thickly covered with bluish white hairs and has a very rounded hood-like upper lip and a broad down-hanging lower lip,

The Skullcap

the opening between them—the mouth—being quite small. The hood is curiously shaped, for it carries as a crest a long, narrow, specially arched portion, the walls of which are so rounded as almost to form a tunnel (*see* diagram at the head of chapter); the part in front turns back on either side to form two little flaps, so that the mouth of the corolla is more or less triangular. The lower lip runs back as the floor of an arched chamber, and is coursed along its length by two mounds with purple lines on either side of them. If one look at the corolla “end on,” one sees, therefore, a tiny circular entrance to an apparent tunnel, and immediately below a somewhat larger triangular entrance to the main petal chamber. It is suggested that the small round orifice is for the use of butterfly visitors, they merely thrusting their long fine proboscides down it, while the larger entrance is for bee visitors, who alight on the lower lip and thrust head and proboscis into the flower as they search for the honey hidden away at the base of the ovary.

Wild Flowers as They Grow

Drawing away the lower lip and peering up into the hood, one can see that the four anthers and their white filaments, together with the long white column from the ovary, all lie up in the tunnel crest at the top of the hood, arching to fit exactly into its lines. The stamens are in pairs, two long, two shorter ; it is asserted that they have only one pollen chamber in their anthers instead of the usual two, one observer noting that this peculiarity is common to the longer stamens and another observer that it is the rule in the shorter stamens, hence one may infer that it is a characteristic to be found, at times, in both pairs. The pairs of anthers lie one behind the other and open on their lower face, so their pollen is rubbed on the bee's back when it thrusts itself into the flower. Perhaps the reason of a narrow channel for a butterfly is to ensure that its fine proboscis shall touch the anthers. If it were inserted into the large lower entrance it would suck the honey and probably not touch the anthers at the top of the hood.

The Skullcap

The style is very long and carries the stigma beyond the anthers. It is not prepared to receive pollen until the anthers have discharged theirs, so that cross-fertilisation is the rule. When it has been effected the corolla withers and slips off, carrying the attached stamens with it. The style, too, withers, and the calyx draws down its upper lip on to the lower, as a tilting helmet closes its visor. The four green nutlets at the base of the corolla, which, by the way, are raised on a short curved stalk, dry and become black within the snug enclosure of the shrivelling calyx. Maturity reached, the now parchment-like calyx opens its lips a little, and the nuts are shot out when it is shaken by drops of rain, gusts of wind, or animals. One can bring about this shooting-out oneself if one draw down the calyx and then let it spring back again into position. One can also notice how its shape determines the direction of expulsion.

The Skullcap is specially addicted to damp meadows and brooksides, its perennial creeping

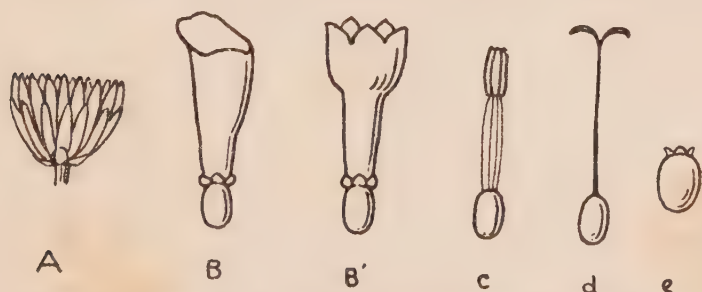
Wild Flowers as They Grow

root turning towards the water. It is rather a weakly plant, a foot or so high, and flowers in July and August. It has only one relative of its own species, the Lesser Skullcap, which is a miniature edition of itself with pale pink flowers.

THE TANSY

TANACETUM VULGARE

THE quaint, old-world name of Tansy has a curious origin. It is a contraction of "Athanasia," by which name the plant was known



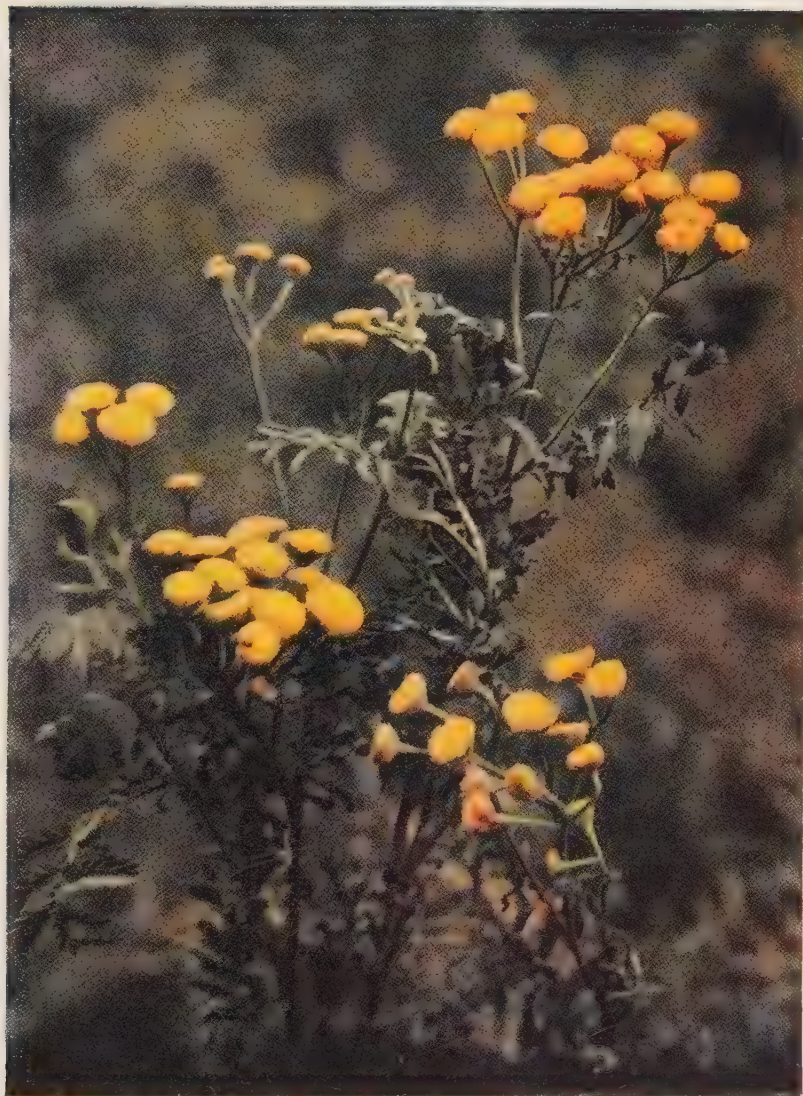
A, involucre of bracts. B, floret of outermost ring. B', inner florets.
c, stamens on seed-case. d, seed-case, style, stigma. e, fruit.

in the days of Queen Elizabeth, and "Athanasia" is from a Greek word meaning immortality. The plant got the name because it was supposed that when Jupiter told Mercury to take Ganymede away, and added "and when he has drunk of

Wild Flowers as They Grow

immortality, bring him back as cupbearer to us," the drink given was the hot juice of the Tansy. This derivation is generally accepted, though one old writer ventures on the assertion that the idea of immortality in connection with this plant is due to the length of time that the flowers persist unwithered, a much less romantic suggestion. The Latin name *Tanacetum* means literally "a bed of Tansy."

The Tansy is a tall plant, two to three feet high, a striking individual by roadside and on field borders. Its stiff shrubby stems are angular and grooved; its leaves are prettily and deeply cut into many fine segments, the "cutting" being carried to such an extent that even the margin of every segment is toothed. Under a lens it will be seen that the surface of the leaves is punctuated by innumerable dots—glands containing an essential oil of strong aromatic flavour and scent. It is this oil that has given the Tansy its value in medicine and cookery. Tansy



TANSY

The Tansy

tea is an old and once much-valued tonic. It was given in fevers, for dropsy and, above all, was "a singular remedy for the gout." The bitterness of the oil made the leaves an excellent substitute for the "bitter herbs" with the Paschal lamb, and they were often eaten in Lent with a penitential intention. But the aromatic quality raised the plant above a mere bitter herb. "This balsamic plant may supply the place of nutmegs and cinnamon, for I believe Asia does not supply a plant of greater fragrance than the Tansy," was the verdict of Boerhaave, the celebrated Dutch physician. Hence was it sometimes called "Ginger."

In olden days, too, housewives laid much store by Tansy puddings and Tansy cakes. Did not Pepys give "a tansy and two neats' tongues and cheese, for the second course," when he wished once to give a "pretty dinner" to his visitors? And Gerard tells us that "In the Spring time are made with the leaves hereof newly sprung up and with eggs, cakes, or tansies, which be pleasant in taste,

Wild Flowers as They Grow

and good for the stomacke.” Here is an old recipe for making them:—

“Take a 1d. Manchet,* grate it very fine, add a handful of fine Flour and the yolks of six eggs; then grate on two Naples Biskets; make these thin into a Batter with Rose-water and Canary, then add two ounces of the Tansie or Garden Tansie. After it is well clarified and settled, add an ounce of the Juice of Clary with a little beaten Cinnamon and Sugar. Fry these in sweet Butter over a gentle Fire till it becomes somewhat brown, but beware of burning it, for then it is spoiled; then serve it up sprinkled with Rose-water wherein Saffron has been infused, and scrape over some Loaf Sugar.”

Tansy cakes were specially eaten in Lent as a digestive corrective in times when men better observed the forty days fast of fish and pulse than they do now. In addition to being finely chopped and served in omelettes, the young leaves were

* Bread Roll.

The Tansy

used to colour various dishes, indeed the Finlanders even extracted a definite dye from them. Sometimes, too, they were put into ale, and hence the plant has been known as "Ale-coast," or, abbreviated, as "Cost." A curious Buckinghamshire name "Joynson's Remedy Cheese," no doubt refers to some forgotten worthy who prescribed Tansy cheese to country patients. The thick tough root of the Tansy used also to be candied and eaten as a medicinal sweetmeat; even the flowers were dried, powdered and mixed with treacle, and so formed a strong-flavoured posset agreeable to village palates for certain internal troubles.

The very conspicuous arrangement of the flowers is a case of the essence of clustering. Great yellow bunches of often forty or more blooms top the plant with flat golden platters, technically known as "corymbs." Each bloom is a tiny green cup, about as big round as a threepenny bit, and filled with, or rather overflowing with, gold. And the golden contents are really hundreds of perfect

Wild Flowers as They Grow

miniature flowers, perhaps four hundred of them set side by side tightly packed together, and the cup containing them is the "involucre" of green bracts. Each flower is tubular and of a structure very similar to those florets that make up the yellow eye of a daisy, for the Tansy and the daisy are both members of the same family, the *Compositæ*. But, practically speaking, all the florets are alike in the Tansy as they are, for instance, in the groundsel, though sometimes it is suggested that the members of the outermost ring have their corollas *very* slightly elongated on the outer side, so as to suggest an early development of ray florets. Five teeth on the top of the corolla tube indicate the five petals by whose union it is formed; there is scarcely any trace of a calyx; the seed-case is below the petal tube, and, within, the five stamens stand, their filaments five separate strands, their heads joined into the usual cylinder characteristic of all the members of the family.

The column from the ovary is tipped with a

The Tansy

bunch of hairs, a regular brush which passes up through the anther cylinder as the column grows and sweeps before it all the dusty pollen that has been discharged into the cylinder. For a short space the little heaps of pollen lie on the top of each tube, and it is at this moment that the many flies, bees and beetles that tread these brilliant platforms plunge through these heaps, and scatter them abroad. The amount of cross-fertilisation thus effected must be enormous, even though only a portion of the possible 16,000 florets of a cluster are mature simultaneously. The flowers mature in rings, the outermost rings first, and then, successively, the rings within unto the centre. It must be noticed that in the outside ring—that one in which the florets sometimes suggest a possible development of ray—there are no stamens, these florets are purely female flowers with merely a seed-case and a style.

After the opening of the anthers and the scattering of the pollen the top of the style opens out

Wild Flowers as They Grow

into two branches, and the fork just appears above the five teeth of the corolla, so that it is precisely on a level with the pollen masses that have by that time appeared upon the florets on the inner side. This development, like that of the stamens, takes place in successive rings.

The fruit of the Tansy is a hard, dry little object lacking the feathery hairs or "pappus" that tops so many of the seeds of its relatives, and is evidently not intended to make its way by flight.

The Tansy is a late summer flower; August and September are the months on which it sheds its brilliance. While generally accepted as an indigenous plant its right to true British nationality is sometimes questioned. No doubt it was a definitely cultivated plant in the Middle Ages, but undoubtedly, too, it was even then found "wild."

THE BLACK NIGHTSHADE

SOLANUM NIGRUM

THE common was wide and open, heath and ling covered it with a ruddy mantle, gorse punctuated it with golden splashes. At first sight



a, sepals. *b*, petals, front and side view. *c*, stamen. *d*, seed-case, style, stigma. *e*, fruit and calyx.

it seemed a piece of nature in her primeval simplicity. But as one traversed one of its narrow paths, here and there one came across little messy clearings, little collections of rubbish—old pots and pans and such-like cast-offs—that spoke more eloquently of the debasing presence of man than did the row

Wild Flowers as They Grow

of picturesque cottages at the common's remote edge. And by one such rubbish heap, not far from a clump of nettles, grew a little patch of the plant of our picture—the Black Nightshade—cheek by jowl with heather and gorse, but looking very much out of place in that company. Yet its situation gave the keynote of its personality. It was out of place, inasmuch as it could by no means rank with the heather and gorse as an original possessor of the common, but it was strictly in harmony with its nature in being allied to the débris of the cottagers, for the Black Nightshade, like the stinging nettle, is a hanger-on to the skirts of humanity. While gorse and heath glowed on the common long before the eye of man ever fell upon them, this plant had followed in man's footsteps; the natives would have been there whether or no man had come, but not the Black Nightshade. It is a "weed of cultivation," a denizen of waste places and untended gardens; it is only to be found on land that has had relationship with man. Hence the



BLACK NIGHTSHADE

The Black Nightshade

Saxons knew it as *Mixplenton*, a mixen being a rubbish heap, while the old herbalists generally referred to it as "Garden Nightshade." It, however, claims nationalisation in our land by virtue of length of residence.

Very adaptable, very unexacting, the Black Nightshade is one of the world's most widely spread weeds, a true cosmopolitan, to whom the snows of the Arctic and Antarctic alone seem barred. And with its adaptability goes variability, variability that runs to such excesses in warmer, more luxuriant climates that the plant is said to have been described under no fewer than forty different names. On that Norfolk common it was a typical British specimen, a smooth herb barely a foot high. Its much branched stalks were thick and juicy and of a very dark purple hue, and they carried many pale green leaves of triangular shape, whose margins were cut by a few big angular teeth. Little white flowers of quaint appearance hung in small clusters that are botanically known as "cymes," because in that form of arrange-

Wild Flowers as They Grow

ment the buds at the tip come out first and form the oldest flowers, the inner buds developing later in due sequence. (In the wild hyacinth, for example, this procedure is exactly reversed.)

Each flower has five green sepals backing it, and a white star-shaped corolla in which the five petals are united at their base to form the very shortest of tubes. Sometimes the whiteness of the petal tips is stained with a dark blue spot, and occasionally a narrow purple line runs down the centre of each lobe to an orange-tinted circle—the top of the tube. It has been suggested that these markings are probably the beginning of a special appeal for fly visitors, for such, as is well known, are particularly drawn to dull purple coloration.

In the centre of the white corolla there is what Gerard calls “a yellow pointal,” really a blunt cone, built up of the heads of the five stamens. Now the stamens stand on the corolla, but having no filaments to speak of they are practically all head, the head being particularly large.

The Black Nightshade

At the extreme tip of the cone are ten tiny round holes, two to each stamen, and out through these the pollen will later be shaken, as pepper is shaken out of a pepper castor. In the centre of the cone's end a single green tip shows itself; it is the stigma—the head of the seed-case column—the said case being hidden down within the calyx and tube of the corolla.

The flowers are honeyless, so their visitors are pollen-eating hover-flies and bees. These seize on the drooping flowers, and in the shaking thus given the pollen falls upon the visitors' bodies. Sprengel (*circa* 1793) to whose intelligent observations we owe our first conception of the intimate relationship that exists between flowers and insects with regard to the fertilisation of the former, watched the Black Nightshade most carefully, and accurately noted how bees "struck vigorously against the anthers so that pollen fell out, and little white balls of this were to be seen on their hind legs." Since the stigma projects a little beyond the stamens there is

Wild Flowers as They Grow

considerable chance of its receiving pollen from another flower before any from its own stamens can pollinate it.

The fruit is a berry held in the calyx which remains unfaded when the petals fall. Green at first it is quite black when ripe, hence the plant's name of Black Nightshade, in contradistinction to the better-known, more conspicuous Woody Nightshade, or Bittersweet Creeper, where the berries are scarlet. Hence, too, another more ancient name "Petty Morel," morel coming from the French *morelle*, which itself is derived from *Moro*, a Moor, an individual whose dusky complexion is proverbial. (The Great Morel is its relative, the Deadly Nightshade, *Atropa Belladonna*.) In this country the black juicy berries are poisonous to some extent, but this does not seem to be the case in all climates. Thus in certain parts of Russia they are said to be quite sweet and edible, while in Norfolk Island the convicts of old used to collect, cook and eat them. No doubt a certain narcotic

The Black Nightshade

quality runs through the tissues of the plant, and the herbalists were accustomed to mix the juices of the leaves with barley meal and apply them as a dressing for inflammations. For the same purpose the leaves were sometimes "stamped" and mixed with an ointment made from poplar buds. But, either because the plant is really poisonous, or because it partakes of an abhorrence reflected from its relative, the Deadly Nightshade, it was used with great caution, for as an old herbalist sagely remarks in reference to it "many times there happeneth more danger by applying these remedies than by the disease itself."

The Black Nightshade may be found in flower from July onwards into late autumn. It belongs to the family *Solanaceæ*, which is more or less a family characteristic of tropical regions, embracing such well-known plants as the tobacco, the petunias, and the cayenne pepper. Other relatives, the potato, the tomato, and the egg plant are in common cultivation here, but only five members of the

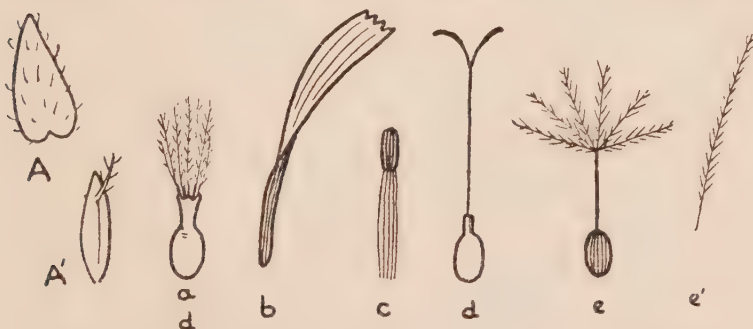
Wild Flowers as They Grow

family grow wild in England, and probably none of them belongs to the original flora of our land. These five are—the Henbane (*Hyoscyamus niger*), the Thorn Apple (*Datura stramonium*), the Deadly Nightshade (*Atropa Belladonna*) and the two Solanums, namely the Bittersweet (*S. dulcamara*), and the Black Solanum (*S. nigrum*).

THE OX-TONGUE

HELMINTHIA ECHIOIDES

A COARSE wayside weed with composite clusters of flowers of the hawkweed type, the family likeness of the Ox-tongue to others of



A, heart-shape outer bract. A', inner bract. a d, calyx on seed-case. b, corolla. c, stamens. d, seed-case, style, stigmas. e, fruit. e', feathery plume of fruit.

the *Compositæ* order is so strong that, as in the case of certain famous twins, it is often difficult to know "t'other from which." And so, moderately common though it is in late summer and autumn

Wild Flowers as They Grow

on roadside and field border in various parts of England, it is apt to lose its identity in the mists of that confusion of thought with which, for the most part, we regard this class of plant. Let us, therefore, carefully differentiate it from its relatives.

Rough stiff stems, markedly ribbed, are embraced by stalkless leaves, which leaves are "like the rough tongue of an Oxe or Cowe whereof it tooke its name," says Gerard. The roughness of the leaves is emphasised by great blobs or papillæ which rise here and there from the surface, by stiff hairs fringing the margin, and by similar hairs that are scattered over the whole leaf and are specially noticeable along the midrib at the back. Sometimes the hairs are particularly prominent as they rise from the top of a blob, and while they are often simply pointed, sometimes they are hooked at the end, and this all enhances the roughness of the leaf to the touch. Usually the leaves have just a simple unbroken outline, but occasionally the margin is somewhat waved.



OX-TONGUE

The Ox-Tongue

So far, however, the Ox-tongue is but little different from the hawkweed picris, and certainly could not be distinguished from it by this description, but when we come to the heads of flowers we come to points of real identification, and to one in particular. Round each head stands, sentinel-like, a ring of five green heart-shaped bracts, large, stalkless, rough and hairy, for here the involucre (as the collection of bracts at the base of each blossom in this family is called) is divided into two sets of bracts, outer and inner. Usually all are more or less alike in shape if not in size, but this plant can always be known by the very pronounced outer ring of these five heart-shaped bracts, and the inner ring of narrow, pointed bracts clasping more closely the florets, and standing side by side like stakes in a fence. But the inner bracts are not without their note of distinction, too. On the back of each, a little below the tip, rises a most ferocious, spiny-looking process, branching into white stiff hair-spikes, which processes rise like a

Wild Flowers as They Grow

crown above the ring of bracts, and no doubt keep off intruding insects in both bud and fruiting stages of the bloom. One needs a lens properly to appreciate these structures.

The flower-heads are yellow and much resemble the small hawkweeds one sees everywhere in the autumn. They are made up of many florets, each looking like a little yellow strap. And there are no more dainty specimens of floral workmanship than some of these florets of the *Compositæ*, the Ox-tongue being a notable example. The lens again is necessary to appreciate their beauties. The calyx of a floret is a ring of white silky hairs, each hair feather-like; the corolla, an almost colourless tube below, spreads half way up into a golden strap with five minute teeth at its tip; inside the tube are five stamens, their heads joined together to form a hollow cylinder, though their delicate white filaments have remained separate. Calyx, corolla, and stamens stand on the seed-case. Now the

The Ox-Tongue

seed-case projects upwards with a small beak (*see* the diagram), which beak is another special mark of the Ox-tongue. From the top of this beak rises a white column with thickened tip. At first its top just reaches the cylinder, and the stamen heads opening on the inside pour their pollen into the cylinder whose floor is the column top. But the column goes on growing so the floor rises pushing the pollen before it until the top of the cylinder is reached, and the pollen mass is projected into the open. Not long does it rest there, crawling little flies brush among the floury heaps and scatter them to their work of fertilising adjacent florets, or carry off the grains to pollinate other blooms on other plants. And still the column grows, and now its thickened tip opens into two wide-spreading branches which stand out well above the corolla tube against the background of the strap, and receive a baptism of pollen from younger florets.

When the blooms fade the bracts draw together

Wild Flowers as They Grow

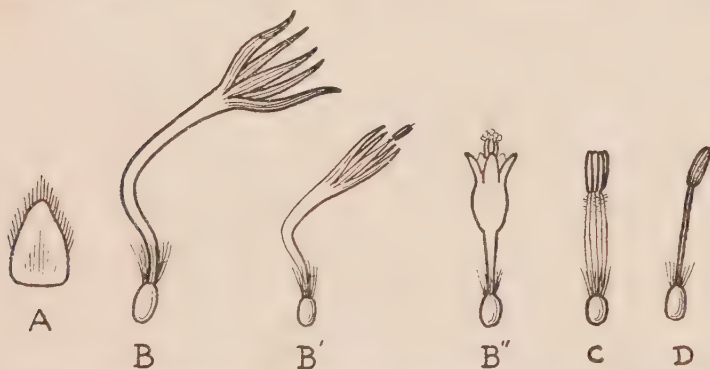
as in the bud, and enclose the withered, but not dying, remains, for the seed-case grows, the beak lengthens, and presently there comes a day when the whole head bursts open into a new beauty. Each seed-case is now crowned with a parachute, the calyx hairs have spread like the ribs of a sunshade, their delicate branching forms a network cover between the ribs, and once more under the lens the Ox-tongue vindicates its claim to charm.

In olden days the plant was often called "Lang de beef"—a curious Anglicised version of the French *Langue de bœuf*. It was once known as a pot-herb, though the bitterness of its juices hardly suggests it to our minds as a table delicacy.

THE GREATER KNAPWEED

CENTAUREA SCABIOSA

THE distinction between the Greater and the Lesser, or Black, Knapweeds, is something more than that of mere size, though it is true



A, fringed bract of involucre. B, outermost sterile floret. B', B'', inner and innermost fertile florets. C, stamens on seed-case. D, seed-case, style, stigma.

the two are often mistaken the one for the other. For one thing the leaves are very different; in the Black Knapweed they are long, narrow, and quite

Wild Flowers as They Grow

simple on the upper part of the plant, even those at the base of the main stalk are only cut by small teeth or tiny lobes ; but in the Greater Knapweed they are quite elaborate, being divided into many segments, a dozen to thirty, the slashing often reaching right down to the centre line, so that the midrib appears merely as a stalk carrying green lobes. Sometimes therefore the leaves, which are really sessile, appear stalked, but a careful search will always reveal traces of tiny green lobes or teeth, remnants of a once full-grown blade, to show that the stalk is, after all, just a midrib. Since the segments are also liable to be again cut into smaller lobes, the whole foliage of a well-grown plant is quite handsome and striking, which is more than can be said for its humbler brother.

To this dissected foliage can be traced some ancient and curious names of the plant. In olden days the Greater Knapweed was commonly known as " Matfellon," " Matefelon," " Materfilon " (the shopkeeper's name for it in the sixteenth century)



GREATER KNAPWEED

The Greater Knapweed

“Madefelon,” or “Maudefelune”—there is a pleasing elasticity about the spelling of those times—and it was sometimes said that the names arose from the fact that the rough hard stalks and flower-knobs were used for the chastisement of felons! Which explanation is more ingenious than probable. But since there were “felons” other than criminals, to wit, whitlows and other sores, so the herbalists put forward another reason for the names. As Dr. Culpepper (1553) said, “Saturn challenges the herb for his own,” and “Dr. Experience” taught him that it was “singularly good in the treatment of sores,” “healing them so gently, without sharpness.” Then Dr. Prior comes in these less romantic, more matter-of-fact days, and points out that they are really all derived from a Latin word *Maratriphyllon*, meaning “fennel-leaf” because this plant has fennel-like, divided leaves.

In the second place, the Greater Knapweed is distinguished from the Lesser, or Black, Knapweed in that its flower-heads as well as being larger,

Wild Flowers as They Grow

are far showier, for they are ringed round with a row of great purple florets. Indeed, this gay attractive halo to the blooms is the chief characteristic of the plant and its chief point of distinction, for in the smaller heads of the Black Knapweed such a halo is altogether lacking. Now the individual blooms of the Greater Knapweed are carried on the ends of hard, tough stalks, and each consists of a hard, rough globe, ringed with the aforementioned gay florets and surmounted by a dull red-purple cushion of smaller florets. Therefore is the plant sometimes called "Drumsticks" by country children. It is also known as "Horse Knobs," or "Great Horse Knobs," horse being a prefix emphasising greatness, and as "Knobweed," "Knotweed," "Knapweed," and "Hardhead," all names referring to the big globes that form part of the blooms.

When one comes to closer quarters with these flower-heads one finds oneself confronted with a highly specialised piece of Nature's mechanism.

The Greater Knapweed

The globular portion is covered with flat triangular bracts laid in the neat and orderly fashion of slates on a roof, each having a green centre and a black fringe at the tip. Leaning far out over the top of the bract-clothed globe are the florets of the halo, curious, quite empty structures whose lower part, a thin white tube, is partly enclosed in the globe and, bent at right angles, partly thrust outwards to widen into those five fringe-like lobes. As far as these florets appear to be genuine flowers they are shams, though it is open to question if it be fair to call that thing a sham which amply fulfils its purpose, and this they certainly do, for they have only been evolved as lures, to render conspicuous the real florets they encircle.

The genuine florets within the ring have also their lower colourless part wedged tightly into the globe, their upper red-purple part showing. Each consists of a white ovary at the base, crowned by a ring of stiffish white calyx hairs. Within the calyx rises a narrow petal tube ; in the outermost florets

Wild Flowers as They Grow

this is bent so that the mouth of the floret faces outwards, in the inner florets it is erect. In the upper part it widens to form a small inverted bell with five points round its mouth. But the really interesting part of these flowers are the filaments of the stamens, for these are sensitive—"irritable." Just below the anther cylinder—for as usual in all the members of the *Compositæ* family to which the Knapweeds belong, the anthers of the five stamens are united in a ring—there are a number of hairs to be seen. These hairs cover a sensitive region which, if gently touched, causes the filaments to contract suddenly to from one-fifth to one-tenth of their length, of course sharply dragging the anther cylinder down with them. And the result of this sudden movement is that white furrowed pollen grains are shot out of the anther cylinder on to the body of any insect who, so to speak, pulls the trigger. For the stigma brush on top of the ovary column is just at the base of the cylinder chamber, and it is as if a chimney slid down over a sweep's stationary

The Greater Knapweed

brush, instead of the brush being pushed up through a fixed chimney. Anyway the result is the same, the soot—the pollen—is ejected. If one examine closely the stamen filaments one finds that they are remarkably elastic, and can be drawn out to double their length without breaking. They do not immediately spring back, however, when the touch is removed, it takes perhaps ten minutes for them to recover their normal length. But it must be noted that it is only when the flower is young that the stamens are irritable, and it is only this one particular part under the hairs that responds to a stimulus—one can try it for oneself with a bristle or a pin. As the flower ages and the style grows the irritability ceases, and at length when the stigma branches out above the anther cylinder there is no possibility of any movement.

It is the inner face of the styler branches that bears the receptive papillæ which catch and hold the pollen brought to them by visiting insects. It seems to be an open question as to whether a

Wild Flowers as They Grow

flower can fertilise itself. Some observers say no, others assert that, as the flower fades, these stylar branches curl round so far that their surface can touch the hairs on the filaments and thus annex any stray pollen grains that may have been left there, and so self-fertilisation may be a last resort.

The fruit is a dry little achene crowned, for its better dispersal, with a pappus of stiff hairs.

The Greater Knapweed is a plant of waste places and roadsides, not perhaps over-common. It is best found on slopes by the seashore, and it blooms in late summer and autumn.

“ By copse and hedgerow, waste and wall
He thrusts his cushions red ;
O'er burdock rank, o'er thistles tall,
He rears his hardy head,
Within, without, the strong leaves press,
He screens the mossy stone :
Lord of a narrow wilderness
Self-centred and alone.”

A. C. BENSON (*Knapweed*).

GENERAL INDEX

- Anemone, Wood, I. 9
- Arum, Wild, II. 20
- Barberry, VI. 23
- Betony, III. 68
- Bindweed, I. 166
- Bistort, Common, VI. 53
- Blackthorn, IV. 1
- Bramble, III. 91
- Broom, IV. 41
- Buckbean, VII. 29
- Bugle, II. 146
- Bugloss, Viper's, III. 108
- Burdock, VI. 165
- Butterbur, V. 1
- Buttercup, Meadow, III. 51
- Butterwort, II. 175
- Campion, Red, VII. 71
- Campion, White, III. 168
- Celandine, Lesser, I. 1
- Chamomile, IV. 176
- Chamomile, Yellow, VII. 133
- Cherry, Wild, VII. 19
- Claytonia, Perfoliate, VI. 61
- Clematis, Wild, III. 153
- Clover, Hop, VI. 141
- Clover, Red, I. 75
- Clover, White, VI. 133
- Coltsfoot, II. 10
- Convolvulus, Hedge, IV. 121
- Corn-Cockle, V. 136
- Cornflower, III. 176
- Corydalis, Yellow, V. 96
- Cowslip, II. 38
- Crab-Apple, II. 29
- Crane's-Bill, Meadow, I. 97
- Cross-wort, IV. 161
- Crowfoot, Water, II. 100
- Daffodil, III. 1
- Daisy, III. 9
- Daisy, Ox-eye, I. 104
- Dandelion, I. 112
- Dogwood, V. 47
- Eyebright, IV. 75
- Flag, Yellow, III. 25
- Fleabane, IV. 168
- Forget-me-Not, III. 99
- Foxglove, I. 129
- Fritillary, IV. 18
- Fumitory, IV. 113
- Garlic Mustard, VI. 16
- Gentian, Spring, VI. 9
- Geranium, Dove's Foot, VII. 89
- Gladdon, VI. 80
- Golden Rod, III. 183
- Gorse, II. 132
- Groundsel, VI. 192
- Guelder Rose, IV. 91
- Hairbell, I. 183
- Hairy St. John's Wort, III. 139
- Heartsease, IV. 65
- Heath, Cross-leaved, III. 191
- Heather, V. 193
- Hellebore, Green, VII. 1
- Henbane, VI. 124
- Herb Robert, III. 43
- Honeysuckle, III. 34
- Hop, VI. 147
- House-Leek, VI. 73
- Hyacinth, Wild, II. 76
- Ivy, Ground, VI. 38
- Knapweed, Black, I. 122
- Knapweed, Greater, VII. 191
- Lady's Smock, IV. 10
- Lily, May, VI. 32
- Lily of the Valley, V. 32
- Lily, White Water, IV. 145
- Ling, V. 193
- Loosestrife, Purple, VI. 174
- Loosestrife, Wood, VII. 141
- Loosestrife, Yellow, IV. 99
- Lungwort, V. 24
- Mallow, Common, V. 119
- Mallow, Musk, I. 59
- Marigold, Marsh, II. 93
- Marjoram, IV. 137

Index

- Meadow-Sweet, III. 84
 Melilot, VI. 116
 Milkwort, IV. 84
 Moneywort, V. 161
 Monkey Flower, III. 124
 Monkshood, I. 15
 Mignonette, Wild, III. 146
 Mullein, Great, V. 127

 Nettle, Red Dead, IV. 50
 Nettle, Stinging, VI. 104
 Nettle, White Dead, I. 144
 Nightshade, Black, VII. 177
 Nightshade, Deadly, III. 116
 Nightshade, Enchanter's, IV. 106
 Nightshade, Woody, II. 160

 Orchis, Bee, I. 192
 Orchis, Bird's Nest, IV. 33
 Orchis, Early Purple, II. 84
 Orchis, Fly, VII. 55
 Orchis, Fragrant, VII. 47
 Orchis, Lesser Butterfly, VI. 46
 Orchis, Pyramid, III. 59
 Orchis, Spotted, IV. 25
 Ox-tongue, VII. 185

 Parsley, Hedge, IV. 129
 Pasque Flower, VII. 11
 Pea, Tuberous Bitter, II. 124
 Pepper-Mint, III. 160
 Periwinkle, Lesser, V. 10
 Pimpernel, Scarlet, I. 174
 Pink, Cheddar, VI. 66
 Plantain, Greater, VI. 156
 Poppy, Field, I. 24
 Primrose, I. 152
 Privet, V. 87

 Ragged Robin, II. 183
 Ragwort, VI. 182
 Ramsons, VI. 1
 Rattle, Red, III. 18
 Rattle, Yellow, V. 54
 Rest Harrow, IV. 154
 Rocket, Dyer's, VI. 97
 Rocket, Yellow, II. 55
 Rock-Rose, IV. 184
 Rose-Bay Willow Herb, I. 89
 Rose, Dog, I. 41

 Rose, Field, III. 76

 Saffron, Meadow, IV. 192
 Sanicle, Wood, VII. 64
 Saxifrage, Meadow, VII. 111
 Scabious, Field, II. 190
 Sea Holly, VII. 124
 Self-Heal, V. 144
 Shepherd's Purse, VII. 38
 Silverweed, II. 153
 Skullcap, VII. 162
 Snapdragon, III. 131
 Snowdrop, II. 1
 Snowflake, V. 17
 Sorrel, Wood, II. 116
 Speedwell, Germander, II. 106
 Stachys, Hedge, V. 176
 Stitchwort, II. 69
 Stonecrop, Biting, IV. 58
 Strawberry, Wild, I. 50
 Succory, V. 169
 Sweet-Briar, VI. 88

 Tansy, VII. 169
 Teasel, V. 152
 Thistle, Carlina, VII. 155
 Thistle, Dwarf, V. 104
 Thistle, Marsh, II. 167
 Thistle, Spear-Plume, VII. 147
 Thrift, I. 159
 Thyme, Wild, V. 111
 Toad-Flax, I. 137
 Toad-Flax, Ivy-leaved, V. 63
 Toothwort, II. 61
 Trefoil, Bird's Foot, I. 66
 Twayblade, V. 40

 Valerian, Red, V. 80
 Vetch, Kidney, V. 71
 Vetch, Tufted, I. 82
 Vetchling, Meadow, VII. 117
 Violet, Dog, I. 32
 Violet, Hairy, VII. 96

 Wallflower, II. 48
 Watercress, VII. 80
 Woodruff, II. 139
 Wort, Yellow, VII. 105
 Yarrow, or Milfoil, V. 184

CLASSIFIED INDEX

Class I.—DICOTYLEDONS.

Family.	Genus.	Species.	Common Names.	Vol. Page.
RANUNCU- LACEÆ	Clematis . .	<i>C. vitalba</i> . .	Wild Clematis . . .	III. 153
	Anemone . .	<i>A. pulsatilla</i> . .	Pasque Flower . . .	VII. 11
		<i>A. nemorosa</i> . .	Wood Anemone . . .	I. 9
	Ranunculus . .	<i>R. aquatilis</i> . .	Water Crowfoot . . .	II. 100
		<i>R. Ficaria</i> . .	Lesser Celandine . . .	I. 1
		<i>R. acris</i> . .	Meadow Buttercup . . .	III. 51
	Caltha . . .	<i>C. palustris</i> . .	Marsh Marigold . . .	II. 93
BERBERIDEÆ	Helleborus . .	<i>H. viridis</i> . .	Green Hellebore . . .	VII. 1
	Aconitum . .	<i>A. napellus</i> . .	Monkshood . . .	I. 15
	Berberis . .	<i>B. vulgaris</i> . .	Barberry . . .	VI. 23
	Nymphæa . .	<i>N. alba</i> . .	White Water Lily . . .	IV. 145
PAPAVER- ACEÆ	Papaver . . .	<i>P. Rhæas</i> . .	Field Poppy . . .	I. 24
FUMARIA- CEÆ	Fumaria . . .	<i>F. officinalis</i> . .	Fumitory . . .	IV. 113
	Corydalis . .	<i>C. lutea</i> . .	Yellow Corydalis . . .	V. 96
CRUCIFERÆ	Cheiranthus . .	<i>C. Cheiri</i> . .	Wallflower . . .	II. 48
	Barbarea . .	<i>B. vulgaris</i> . .	Yellow Rocket . . .	II. 55
	Nasturtium . .	<i>N. officinale</i> . .	Watercress . . .	VII. 80
	Cardamine . .	<i>C. pratensis</i> . .	Ladies' Smock . . .	IV. 10
	Alliaria . . .	<i>A. officinalis</i> . .	Garlic Mustard . . .	VI. 16
	Capsella . . .	<i>C. Bursa-pastoris</i> (or <i>Bursa Pastoris</i>) . .	Shepherd's Purse . . .	VII. 38
RESEDACEÆ	Reseda . . .	<i>R. lutea</i> . .	Wild Mignonette . . .	III. 146
		<i>R. luteola</i> . .	Dyer's Rocket . . .	VI. 97
CISTACEÆ	Helianthemum . .	<i>H. vulgare</i> . .	Rock-rose . . .	IV. 184
VIOLACEÆ	Viola . . .	<i>V. canina</i> . .	Dog Violet . . .	I. 32
		<i>V. hirta</i> . .	Hairy Violet . . .	VII. 96
		<i>V. tricolor</i> . .	Heartsease . . .	IV. 65
POLYGAL- ACEÆ	Polygala . . .	<i>P. vulgaris</i> . .	Milkwort . . .	IV. 84
CARYOPHYL- LACEÆ	Dianthus . . .	<i>D. cæsius</i> . .	Cheddar Pink . . .	VI. 66
	Lychnis . . .	<i>L. vespertina</i> . .	White Campion . . .	III. 168
		<i>L. diurna</i> . .	Red Campion . . .	VII. 71
		(or <i>dioica</i>) . .		
		<i>L. Githago</i> . .	Corn Cockle . . .	V. 136
PORTULACEÆ	Stellaria . . .	<i>L. Flos-cuculi</i> . .	Ragged Robin . . .	II. 183
		<i>S. Holostea</i> . .	Stitchwort . . .	II. 69
		<i>C. perfoliata</i> . .	Perfoliate Claytonia . . .	VI. 61
HYPERICIN- EÆ	Hypericum . .	<i>H. hirsutum</i> . .	Hairy St. John's Wort . . .	III. 139
MALVACEÆ	Malva . . .	<i>M. sylvestris</i> . .	Common Mallow . . .	V. 119
		<i>M. moschata</i> . .	Musk Mallow . . .	I. 59
GERANIA- CEÆ	Geranium . .	<i>G. pratense</i> . .	Meadow Crane's Bill . . .	I. 97
		<i>G. Robertianum</i> . .	Herb Robert . . .	III. 43

Classified Index

Family.	Genus.	Species.	Common Names.	Vol. Page.
GERANIACÆ	Geranium . . .	<i>G. molle</i> . . .	Dove's Foot Geranium . . .	VII. 89
^{酢醬草} (<i>cont.</i>)	Oxalis . . .	<i>O. Acetosella</i> . . .	Wood Sorrel . . .	II. 116
LEGUMINO- SÆ	Ulex . . .	<i>U. europæus</i> . . .	Gorse . . .	II. 132
	Sarothamnus . . .	<i>S. scoparius</i> . . .	Broom . . .	IV. 41
	Ononis . . .	<i>O. arvensis</i> . . .	Rest-harrow . . .	IV. 154
	Melilotus . . .	<i>M. officinalis</i> . . .	Melilot . . .	VI. 116
	Trifolium . . .	<i>T. pratense</i> . . .	Red Clover . . .	I. 75
		<i>T. repens</i> . . .	White Clover . . .	VI. 133
		<i>T. procumbens</i> . . .	Hop Clover . . .	VI. 141
	Lotus . . .	<i>L. corniculatus</i> . . .	Bird's Foot Trefoil . . .	I. 66
	Anthyllis . . .	<i>A. Vulneraria</i> . . .	Kidney Vetch . . .	V. 71
	Vicia . . .	<i>V. Cracca</i> . . .	Tufted Vetch . . .	I. 82
	Lathyrus . . .	<i>L. pratensis</i> . . .	Meadow Vetchling . . .	VII. 117
		<i>L. macorrhizus</i> . . .	Tuberous Bitter Pea . . .	II. 124
ROSACEÆ	Prunus . . .	<i>P. spinosa</i> . . .	Blackthorn . . .	IV. 1
		<i>P. Cerasus</i> . . .	Wild Cherry . . .	VII. 19
	Spiræa . . .	<i>S. Ulmaria</i> . . .	Meadow-sweet . . .	III. 84
	Rubus . . .	<i>R. fruticosus</i> . . .	Bramble . . .	III. 91
	Fragaria . . .	<i>F. vesca</i> . . .	Wild Strawberry . . .	I. 50
	Potentilla . . .	<i>P. anserina</i> . . .	Silver-weed . . .	II. 153
	Rosa . . .	<i>R. rubiginosa</i> . . .	Sweetbriar . . .	VI. 88
		<i>R. canina</i> . . .	Dog Rose . . .	I. 41
		<i>R. arvensis</i> . . .	Field Rose . . .	III. 76
	Pyrus . . .	<i>P. Malus</i> . . .	Crab Apple . . .	II. 29
ONAGRACEÆ	Epilobium . . .	<i>E. angustifolium</i> . . .	Rose-bay Willow Herb . . .	I. 89
	Circæa . . .	<i>C. lutetiana</i> . . .	Enchanter's Night-shade . . .	IV. 106
LYTHRARIÆ	Lythrum . . .	<i>L. Salicaria</i> . . .	Purple Loosestrife . . .	VI. 174
CRASSULACEÆ	Sedum . . .	<i>S. acre</i> . . .	Biting Stonecrop . . .	IV. 58
	Sempervivum . . .	<i>S. tectorum</i> . . .	House-Leek . . .	VI. 73
SAXIFRAGACEÆ	Saxifraga . . .	<i>S. granulata</i> . . .	Meadow Saxifrage . . .	VII. 111
UMBELLIFERÆ	Sanicula . . .	<i>S. Europæa</i> . . .	Wood Sanicle . . .	VII. 64
	Eryngium . . .	<i>E. maritimum</i> . . .	Sea Holly . . .	VII. 124
	Caucalis . . .	<i>C. Anthriscus</i> . . .	Hedge Parsley . . .	IV. 129
CORNACEÆ	Cornus . . .	<i>C. sanguinea</i> . . .	Dogwood . . .	V. 47
CAPRIFOLIACEÆ	Viburnum . . .	<i>V. Opulus</i> . . .	Gelder Rose . . .	IV. 91
	Lonicera . . .	<i>L. Periclymenum</i> . . .	Honeysuckle . . .	III. 34
RUBIACEÆ	Galium . . .	<i>G. Cruciatum</i> . . .	Crosswort . . .	IV. 161
	Asperula . . .	<i>A. odorata</i> . . .	Woodruff . . .	II. 139
VALERIANÆ	Centranthus . . .	<i>C. ruber</i> . . .	Red Valerian . . .	V. 80
DIPSACEÆ	Dipsacus . . .	<i>D. sylvestris</i> . . .	Teasel . . .	V. 152
	Scabiosa . . .	<i>S. arvensis</i> or <i>Knautea arvensis</i> . . .	Field Scabious . . .	II. 190
COMPOSITÆ	Solidago . . .	<i>S. virga-aurea</i> . . .	Golden-rod . . .	III. 183
	Bellis . . .	<i>B. perennis</i> . . .	Daisy . . .	III. 9
	Inula . . .	<i>I. dysenterica</i> . . .	Fleabane . . .	IV. 168

Classified Index

Family.	Genus.	Species.	Common Names.	Vol. Page.
COMPOSITÆ (cont.)	Chrysanthemum . . .	<i>C. Leucanthemum</i>	Ox-eye Daisy . . .	I. 104
	Anthemis . . .	<i>A. vulgaris</i> . . . <i>A. tinctoria</i> . . .	Chamomile . . . Yellow Chamomile . . .	IV. 176 VII. 132
	Achillea . . .	<i>A. Millefolium</i>	Yarrow or Milfoil . . .	V. 184
	Tanacetum . . .	<i>T. vulgare</i> . . .	Tansy . . .	VII. 169
	Tussilago . . .	<i>T. Farfara</i> . . .	Coltsfoot . . .	II. 10
	Petasites . . .	<i>P. vulgaris</i> . . .	Butterbur . . .	V. 1
	Senecio . . .	<i>S. vulgaris</i> . . . <i>S. Jacobæa</i> . . .	Groundsel . . . Ragwort . . .	VI. 192 VI. 182
	Arctium . . .	<i>A. Lappa</i> . . .	Burdock . . .	VI. 165
	Carduus . . .	<i>C. lanceolatus</i> . . . (sub-division <i>C. palustris</i> Cnicus) <i>C. acaulis</i> . . .	Spear-Plume Thistle . . . Marsh Thistle . . . Dwarf Thistle . . .	VII. 147 II. 167 V. 104
	Carlina . . .	<i>C. vulgaris</i> . . .	Carline Thistle . . .	VII. 155
	Centaurea . . .	<i>C. nigra</i> . . . <i>C. Scabiosa</i> . . . <i>C. Cyanus</i> . . .	Black Knapweed . . . Greater Knapweed . . . Cornflower . . .	I. 122 VII. 191 III. 176
	Helminthia . . .	<i>H. echinoides</i> . . .	Ox-tongue . . .	VII. 185
	Taraxacum . . .	<i>T. Dens-leonis</i> . . .	Dandelion . . .	I. 112
	Cichorium . . .	<i>C. Intybus</i> . . .	Succory . . .	V. 169
CAMPANULACEÆ	Campanula . . .	<i>C. rotundifolia</i>	Hairbell . . .	I. 183
ERICACEÆ	Erica . . .	<i>E. Tetralix</i> . . .	Cross-Leaved Heath . . .	III. 191
	Calluna . . .	<i>C. vulgaris</i> . . .	Ling or Heather . . .	V. 193
PRIMULACEÆ	Primula . . .	<i>P. vulgaris</i> . . . <i>P. veris</i> . . .	Primrose . . . Cowslip . . .	I. 152 II. 38
	Lysimachia . . .	<i>L. vulgaris</i> . . . <i>L. Nummularia</i> . . . <i>L. nemorum</i> . . .	Yellow Loosestrife . . . Moneywort . . . Wood Loosestrife . . .	IV. 100 V. 161 VII. 141
	Anagallis . . .	<i>A. arvensis</i> . . .	Scarlet Pimpernel . . .	I. 174
LENTIBULACEÆ	Pinguicula . . .	<i>P. vulgaris</i> . . .	Butterwort . . .	II. 175
OLEACEÆ	Ligustrum . . .	<i>L. vulgare</i> . . .	Privet . . .	V. 87
APOCYNACEÆ	Vinca . . .	<i>V. minor</i> . . .	Lesser Periwinkle . . .	V. 10
GENTIANACEÆ	Gentiana . . .	<i>G. verna</i> . . .	Spring Gentian . . .	VI. 9
	Chlora . . .	<i>C. perfoliata</i> . . .	Yellow-wort . . .	VII. 105
	Menyanthes . . .	<i>M. trifoliata</i> . . .	Buckbean . . .	VII. 29
CONVOLVULACEÆ	Convolvulus . . .	<i>C. arvensis</i> . . . <i>C. sepium</i> . . .	Bindweed . . . Hedge Convolvulus . . .	I. 166 IV. 121
BORAGINÆÆ	Echium . . .	<i>E. vulgare</i> . . .	Viper's Bugloss . . .	III. 108
	Pulmonaria . . .	<i>P. officinalis</i> . . .	Lungwort . . .	V. 24
	Myosotis . . .	<i>M. palustris</i> . . .	Forget-Me-Not . . .	III. 99
SOLANACEÆ	Hyoscyamus . . .	<i>H. niger</i> . . .	Henbane . . .	VI. 124
	Solanum . . .	<i>S. Dulcamara</i> . . . <i>S. nigrum</i> . . .	Woody Nightshade . . . Black Nightshade . . .	II. 160 VII. 177
	Atropa . . .	<i>A. Belladonna</i> . . .	Deadly Nightshade . . .	III. 116
OROBANCHACEÆ	Lathræa . . .	<i>L. squamaria</i>	Toothwort . . .	II. 61
SCROPHULARIACEÆ	Verbascum . . .	<i>V. Thapsus</i> . . .	Great Mullein . . .	V. 127
	Antirrhinum . . .	<i>A. majus</i> . . .	Snapdragon . . .	III. 131

Classified Index

Family.	Genus.	Species.	Common Names.	Vol.	Page.
SCROPHULA- RIACEÆ (cont.)	<i>Linaria</i>	<i>L. vulgaris</i>	Toad-flax	I.	137
		<i>L. Cymbalaria</i>	Ivy-leaved Toad-flax	V.	63
	<i>Mimulus</i>	<i>M. luteus</i>	Monkey Flower	III.	124
	<i>Digitalis</i>	<i>D. purpurea</i>	Foxglove	I.	129
	<i>Veronica</i>	<i>V. Chamædrys</i>	Germander Speedwell	II.	106
	<i>Euphrasia</i>	<i>E. officinalis</i>	Eyebright	IV.	75
	<i>Rhinanthus</i>	<i>R. Crista-galli</i>	Yellow Rattle	V.	54
	<i>Pedicularis</i>	<i>P. palustris</i>	Red Rattle	III.	18
	<i>Mentha</i>	<i>M. piperita</i>	Pepper-Mint	III.	160
	<i>Thymus</i>	<i>T. Serpyllum</i>	Wild Thyme	V.	111
LABIATÆ	<i>Origanum</i>	<i>O. vulgare</i>	Marjoram	IV.	137
	<i>Prunella</i>	<i>P. vulgaris</i>	Self-Heal	V.	144
	<i>Nepeta</i>	<i>N. Glechoma</i>	Ground Ivy	VI.	38
	<i>Scutellaria</i>	<i>S. galericulata</i>	Skullcap	VII.	162
	<i>Stachys</i>	<i>S. Betonica</i> or <i>Betonica offi- cinalis</i>	Betony	III.	68
		<i>S. sylvatica</i>	Hedge Stachys	V.	176
	<i>Lamium</i>	<i>L. purpureum</i>	Red Dead Nettle	IV.	50
		<i>L. album</i>	White Dead Nettle	I.	144
	<i>Ajuga</i>	<i>A. reptans</i>	Bugle	II.	146
	<i>Armeria</i>	<i>A. vulgaris</i>	Thrift	I.	159
PLUMBAGI- NEÆ					
PLANTAGI- NEÆ	<i>Plantago</i>	<i>P. major</i>	Greater Plantain	VI.	156
POLYGONA- CEÆ	<i>Polygonum</i>	<i>P. Bistorta</i>	Common Bistort	VI.	53
URTICACEÆ	<i>Urtica</i>	<i>U. dioica</i>	Stinging Nettle	VI.	104
	<i>Humulus</i>	<i>H. Lupulus</i>	Hop	VI.	147

Class II.—MONOCOTYLEDONS.

Family.	Genus.	Species.	Common Names.	Vol.	Page.
AROIDEÆ ORCHIDA- CEÆ	<i>Arum</i>	<i>A. maculatum</i>	Wild Arum	II.	20
	<i>Listera</i>	<i>L. ovata</i>	Twayblade	V.	40
	<i>Neottia</i>	<i>N. Nidus-avis</i>	Bird's Nest Orchid	IV.	33
	<i>Orchis</i>	<i>O. mascula</i>	Early Purple Orchis	II.	84
		<i>O. maculata</i>	Spotted Orchis	IV.	25
		<i>O. pyramidalis</i>	Pyramid Orchis	III.	59
	<i>Habenaria</i>	<i>H. bifolia</i>	Lesser Butterfly Orchis	VI.	46
		<i>H. conopsea</i>	Fragrant Orchis	VII.	47
	<i>Ophrys</i>	<i>O. apifera</i>	Bee Orchis	I.	192
		<i>O. muscifera</i>	Fly Orchis	VII.	55
IRIDEÆ	<i>Iris</i>	<i>I. Pseudacorus</i>	Yellow Flag	III.	25
		<i>I. fœtidissima</i>	Gladdon	VI.	80
AMARYLLI- DEÆ	<i>Convallaria</i>	<i>C. majalis</i>	Lily of the Valley	I.	32
	<i>Maianthemum</i>	<i>M. bifolium</i>	May Lily	VI.	32
	<i>Fritillaria</i>	<i>F. Meleagris</i>	Fritillary	IV.	18
	<i>Scilla</i>	<i>S. nutans</i>	Wild Hyacinth	II.	76
	<i>Allium</i>	<i>A. ursinum</i>	Ramsons	VI.	1
	<i>Colechicum</i>	<i>C. autumnale</i>	Meadow Saffron	IV.	192

